THE RUBBER AGE

NOVEMBER 10, 1921 VOL. X. NO. 3

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INDEX TO CONTENTS

Problem of Solvent Recovery 85
Corrected Stress Strain Curve 88
Fire Hazards and Static Electricity 90
Safety First from Factory Managers Viewpoint .. 92
Safe Operation of Reclaiming Plants 93
Abstracts 94
Rubber Goods Exports 95
Rubber Importations 95
Reclaimed Rubber Statistics 96
August Tire Report 96
Rubber Restriction Fails 97
Price Reductions 97
Refuse to Interfere in Portage Sale 99
Court Actions 99
Fisk Rubber Co. Elects Officers 100
Mileage Guarantee Abolished 101

MARKETS

Cottons, Yarns and Fabrics 102
Chemicals and Compounding Materials 103
Crude Rubber 104
Scrap Rubber 104
Reclaimed Rubber 104
New Incorporations 105

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VOL. X NOVEMBER 10, 1921 No. 3

The Problem of Solvent Recovery

By P. Wilcox Gumaer

President, Benzine Condensation Co., New York City

Since the spreading machine was invented by Hancock in 1837, rubber manufacturers have been searching for a practical and efficient method of recovering the evaporated solvent. During the last decade, the cost of available solvents has increased to such an extent that the recovery of these solvents has become of great economic importance.

The first attempts at the recovery of solvents were extremely crude, due to the misconceptions and the lack of detailed knowledge concerning an apparently simple process. All of the first attempts and some of the more recent ones endeavored to condense hot air, saturated with benzine vapor, as if it were pure benzine vapor. Although the density of gasoline or benzine gas is greater than that of air, many attempts were made to obtain a condensite from the mixture drawn off near the top of the apparatus.

It is needless to say that many of these attempts resulted in failure and some even disastrously, due to the explosive properties of these gasses when mixed with air. All solvent recovery systems require that the heating table, where the solvent is evaporated, be covered with a hood, made more or less air tight.

In the earlier systems, the mixture of air and solvent vapors was drawn from the hood and condensed in metal tubes, cooled below zero in an ammonia refrigerating machine.

A modification of this method is to compress the air and vapor by means of a pump. After compressing, the mixture is cooled in a water condenser. Condensed vapors are collected at the bottom, the air is allowed to expand and further condensite is collected.

While either of these methods would give satisfactory results, if the gas passing through the condensors were pure solvent vapor; the fact that a large percentage of air is included in the mixture causes great difficulty and often failure.

Recently the absorption process has been used to some extent. Straw oil or other chemical substances, such as creasol, are used to absorb the solvent gas. The mixture of air and gas is passed through a series of scrubbers. The resulting liquid is then heated and a portion of the solvent is recovered by fractional distillation. The disadvantage of this method is the high cost of recovery, running in many cases as high as fifteen cents a gallon for gasoline. The system is also complicated and requires expert supervision.

During recent years a method of solvent recovery entirely different from those just described has been developed. Instead of drawing large quantities of air into the enclosing hood, air is excluded as far as possible. And, instead of drawing

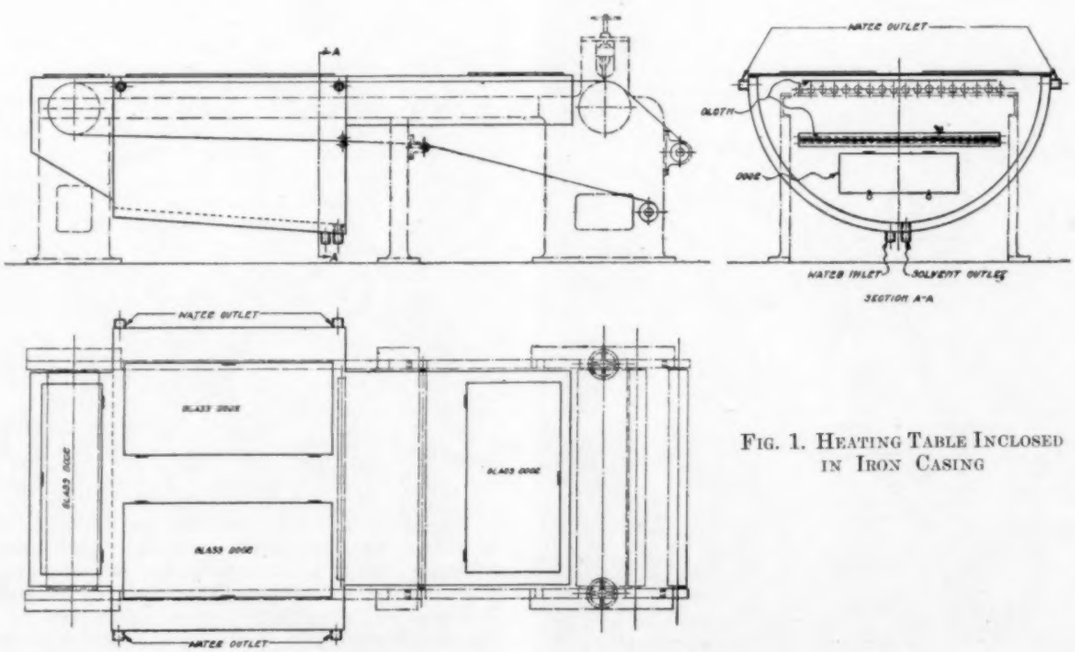

FIG. 1. HEATING TABLE INCLOSED IN IRON CASING

the solvent vapors into a separate condensing apparatus, a condensor is built into and forms a part of the condensing hood. No fans, blowers, or pumps are used. The natural circulation of the vapors are sufficient, when the apparatus is properly designed.

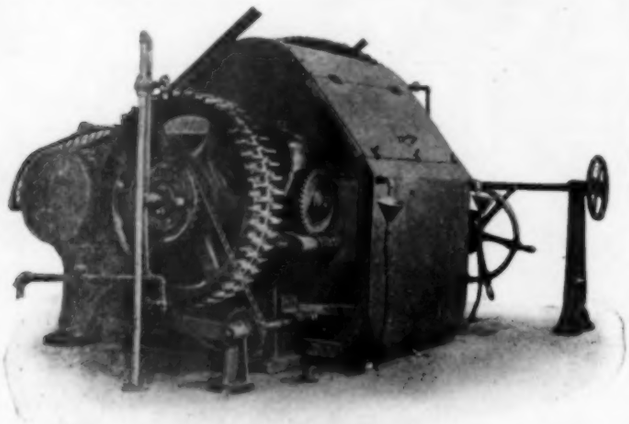

FIG. 2. APPARATUS APPLIED TO SHEETER CALENDER

Figure 1, shows the application of this system to an ordinary spreading machine. The entire heating table is inclosed in an iron casing. The rear part of this inclosure, which extends considerably below the heating table is water-jacketed. Ordinary tap water at a maximum of 70 deg. F. circulates in the water-jacket. This keeps the sides and the bottom of the gas chamber cool. The solvent vapor when evaporated from the fabric passing over the steam coils is drawn down by the partial vacuum created by the condensation of solvent already cooled. When the machine begins operation it is full of air. The solvent vapor being heavier than air rapidly displaces the air within the apparatus, so that a few minutes after the machine starts the apparatus contains nearly pure solvent vapor. The complicated and expensive expedients, necessary to recover the solvent vapor when mixed with large quantities of air are thus avoided. As shown by the drawing, the apparatus is of extreme simplicity.

The advantages of this simplicity are obvious. Cost of installations is small. No expert attention is required. Upkeep is practically nothing and the cost of operation is almost negligible. At temperature of 70 deg. F. approximately twenty gallons of cooling water is required for each gallon of solvent recovered. In winter, with cooler water, a smaller quantity is required.

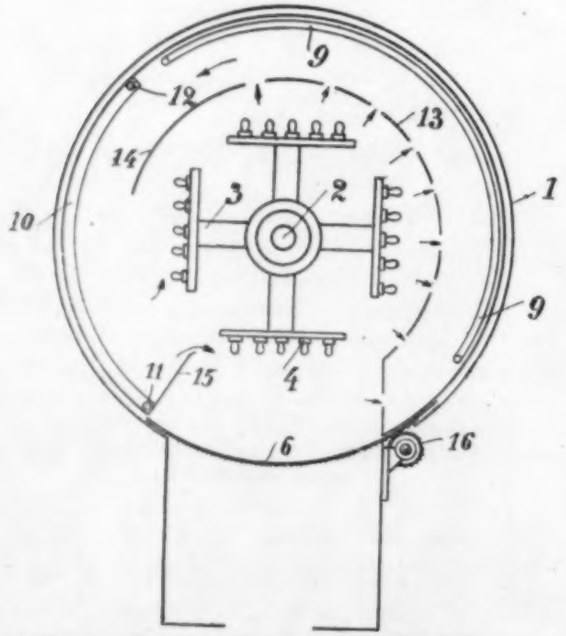

FIG. 3. SYSTEM APPLIED TO DIPPING MACHINE

In addition to the removal of the unhealthy fumes from the air of the working rooms and the recovery of the solvent, another large advantage of this method of recovery is the reduced risk of fire and explosion. A mixture of air and gasoline vapor will not explode, except when mixed in the proper proportions. The percentage of gasoline vapor must not be under 2.8 per cent or over 4.4 per cent. As the solvent recovery apparatus contains very little air and nearly pure benzine vapor, no explosion can occur inside the apparatus. Although it is possible through negligence for the solvent vapors to catch fire at the openings where the fabric enters or leaves the apparatus, this can readily be smothered out. The fire cannot spread inside the apparatus, as there is not sufficient oxygen present to support combustion.

The spreading machine illustrated in figure 1 can be operated aproximately 10 per cent faster, when equipped with the solvent recovery apparatus, because the partial vacuum created within the apparatus causes the solvent to evaporate more rapidly from the fabric.

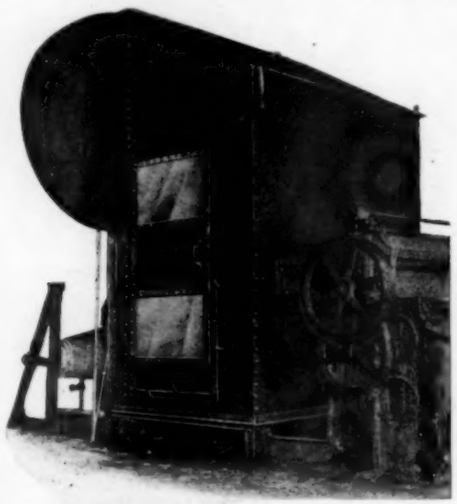

FIG. 4. APPLICATION TO AN IMPREGNATING MACHINE

As the apparatus completely encloses the heating coils, less heat is lost into the room. The result is cooler working conditions during the summer and a small saving in the amount of steam used.

Figure 2 is an illustration of the recovery apparatus applied to a sheeter calender used in the manufacture of asbestos packing. The "dope" is put in the back of the machine through a sliding door. The door on the front side permits the finished sheet to be removed. Glass in the sliding door enables the workmen to watch the progress of the work.

In addition to the recovery of the solvent, a better grade of packing is obtained. The wet mixture is shovelled onto the machine, between the large and small rollers. During the interval that it takes to use this up, the upper surface of the "dope" becomes partly dry. Where this dried material is rolled into the sheet, there is a tendency to form a bad spot. When the solvent recovery system is in use, the wet "dope" does not begin to dry until it reaches the hot roller, so that these bad spots are avoided.

Figure 3 shows this solvent recovery system applied to a dipping machine, used in the manufacture of seamless rubber goods. (1) is the enclosing hood, (2) is the arm around which the molds can be revolved, (3) and (4) are the molds which have been dipped into the solution and are being dried, (6) is the cover which closes the opening through which the molds are dipped. (9) is a steam coil, (10) is a cooling coil, (11) is the outlet for the solvent, (13) and (14) are baffles to aid the proper circulation of the gases and to prevent the direct radiation of the heating coils from causing blisters on the

rubber, (15) is a trough to collect the condensed solvent and (16) is the gearing for opening the bottom cover.

The circulation of the gases is shown by the arrows on the drawing. The hot vapors pass through the baffle, up one side and down the other along the cooling coils. It will be noted that the apparatus is closed to the outside air. The evaporation and subsequent condensation of the solvent, without the use of large amounts of air, results in freedom from troubles due to changes in the condition of the atmosphere. For example, the use of this apparatus prevents the formation of blisters which are a great source of trouble in the manufacture of seamless rubber goods.

Figures 4 and 5 illustrate the application of this method of solvent recovery to an impregnating machine, used in the impregnation of the cords for cord tires. The principle is the same as that previously described for spreading machines and sheeter calenders. In this case the fabric passes down through the solution of rubber and solvent, between two large rollers and then into the drying chamber. Steam coils are arranged vertically, the fabric passes up and down between the coils, coming out at the back as shown in figure 5. Baffles inside the apparatus control the circulation of the gases, cooling coils along the back and bottom condense the solvent. This particular machine has a recovery capacity of 50 gallons of gasoline an hour. The impregnating process is continuous, the cloth from each succeeding roll is sewed onto the cloth of the preceding roll. A large door, shown in figure 4, permits entrance to the apparatus for repairs or adjustments.

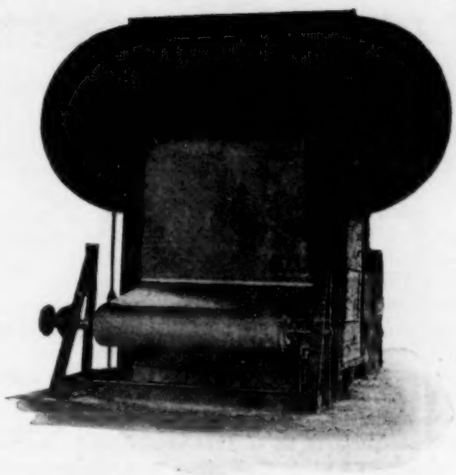

FIG. 5. ANOTHER VIEW OF IMPREGNATING MACHINE

Note—The patents covering the solvent recovery apparatus illustrated in this article are owned by the Benzine Condensation Company, New York City.

The Peculiar Law of Freight Charges

By Elton J. Buckley

The law as it concerns the charging and collection of freight is totally different from the law as to any other form of collection. In a sense a railroad isn't responsible for its own mistakes like an ordinary concern is. For instance, suppose you are a commission merchant selling goods on commission, and the P. R. R. delivers commission stuff to you. It tenders a bill for the freight, you pay it, deduct it from the proceeds of the goods when sold and remit the net returns to your principal. Then after you have parted with all of your principal's money, the railroad comes in with the statement that it made a mistake in the freight and it is so much more. "But," you say, "I can't pay any more, because I have settled for those goods and have no more money in my hands." In the ordinary case the person claiming the freight would be made to bear the consequences of his own mistake, but the railroad is not. In a situation like the above, it can collect the balance, on the theory that freights must be absolutely uniform, and allowing one person to pay less freight than another, even though the railroad's mistake, would be irregular and would open the way to all kinds of fradulent collusion between dishonest shippers and dishonest railroads.

I have another case before me now which also shows how the law favors railroads in this respect. The information in this case may serve some readers hereof in a similar situation. A concern named H. S. Moore & Co. had certain goods shipped to it under a contract which required the buyer to pay the freight. As every reader hereof knows, the buyer in very many such transactions pays the freight, and the railroad expects that and collects from him as a matter of course. In this case the railroad should have done this, too, but in some way it slipped up. The goods were delivered to Moore & Co., entirely through the railroad's mistake, without any demand for the payment of freight and without any payment.

Several weeks later Moore & Co. went into bankruptcy and in some way the unpaid freight charge turned up. Of course the railroad could not get it out of Moore & Co., for they were bankrupt. In the ordinary case the road, having negligently failed to get the money from Moore & Co. when they had it, would have had to swallow the loss itself. But in this case the road went back to the consignor and said, "Here, you'll have to pay this freight." "Oh, no," said the consignor, "I have nothing to do with it. The freight on these goods was to be paid by the buyer. If you had been on the job you could have collected it from the buyer, because eight months ago Moore & Co. weren't bankrupt, and furthermore, you didn't have to deliver the goods unless the freight was paid." A reasonable defense, one would think, but it didn't hold water when the case got into court. The decision both in the lower court and the Appeal Court was that the consignor must pay. Therefore the railroad forced the freight out of a man who by the very terms of his contract was absolved from paying it. It seems unfair, but the law reasons that it is better to be unfair in individual cases than to leave *any* loophole open for freight rebates and freight irregularities.

The reasoning of the court in the case I am discussing was as follows:—

> We regard the question raised on this appeal as decided. The defendant was a consignor. The bill of lading was a contract between it and the plaintiff for the transportation of freight for the compensation agreed on. All of the authorities are to the effect that the consignor, whether the owner of the goods shipped or not, is the party with whom the carrier contracts for the transportation. He creates the bailment and is responsible for the cost thereof. Such a contract may be implied from the mere fact of the delivery of the merchandise for shipment. Nor is the primary liability of the shipper affected by the direction of the carrier to his employes that the charges on shipments must be collected (from the consignee) before any part thereof is delivered. The bill of lading expressly charged the owner or consignor with the payment of the freight, and the direction with respect to collection from the consignees was in the interest of the carrier and not a contract relation with the consignor. It was a matter of indifference to the carrier whether the freight was paid by the consignor or the consignees, but the company had the right to adopt such instructions to its employes with reference to the collection of carrying charges as might be convenient or promotive of its interests. The carrier was not prejudicially affected by the knowledge of the shipper that a general direction was given that freight charges if not prepaid should be collected before delivery. In the absence of a contract to that effect, no duty rested on the carrier to collect from the consignee. It could waive the lien and deliver the freight without collecting the charges. It was to the consignor's interest equally with the carrier's to see that the freight bill was paid. Nothing in the case shows that the carrier constituted itself an agent of the shipper to collect his debts and the fact that such charges might have been recovered from the consignee does not relieve him (the consignor) from the primary liability to pay.

Corrected Stress Strain Curve for Rubber

By J. W. Shields

Research Laboratory of the Goodyear Tire & Rubber Co.

It is customary when studying the physical properties of rubber to plot the stress strain curve as in figure 1. The stress may be expressed either as the increase in length of the specimen, taking the original as the unit or in terms of per cent elongation. The former method is more commonly used in England and the latter in America. The stress is expressed in terms of the load per unit of original cross section. When plotted in this way the curve shows a peculiar S shape which distinguishes it from the stress strain curve of other materials. The peculiarity of this curve has been commented on by many investigators. Stevart* noted that according to this curve the modulus of rubber was greatest when at a minimum elongation and at a minimum when at 100 per cent elongation where the curve passed through what he termed the point of inflection.

The ordinary stress strain curves as shown in figure 1, do not represent the characteristics of rubber, as the most obvious

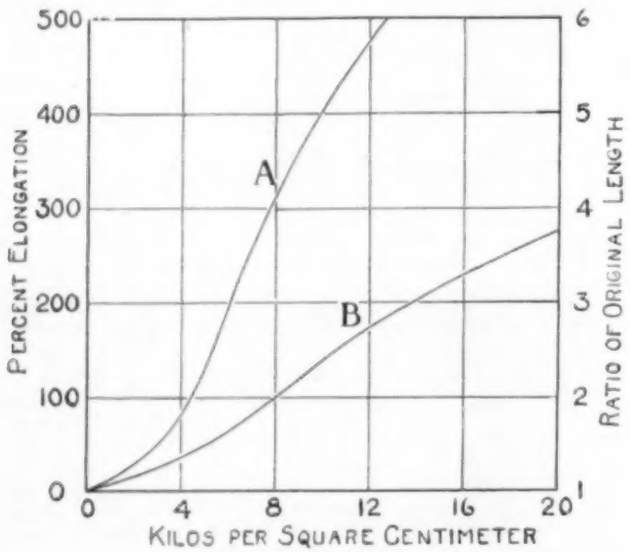

FIG. 1. UNCORRECTED STRESS STRAIN CURVES OF RUBBER
A = PURE GUM, 7½%S; B = COMPOUNDED STOCK

property, its great extensibility and accompanying decrease in cross section is not taken into consideration. A curve for which the stress is based on the original cross section is fairly accurate for steel and other substances with low extensibility but becomes misleading when applied to rubber. When a test sample is stretched to twice its original length the cross section diminishes by one half if the volume remains constant and the stress to which the sample is subjected is twice that shown on the graph. At 900 per cent elongation a sample is under 10 times the stress indicated by the curve.

If the data from which the curves in figure 1, is plotted be corrected for the decrease in cross section and replotted, curves of an entirely different type are secured as is shown in figure 2. These curves represent the stress in terms of the load per unit of actual cross section. From figure 2 it is seen that the peculiar S shape, so characteristic of the uncorrected curves, is the result of elongation and does not represent a change in modulus as Stevart interpreted it. A study of the corrected curves shows that the modulus is least at the smallest elongation, and varies but little for the region of deformation to which the rubber is subjected in most service. The modulus determined from a corrected curve at zero elongation is an accurate measure of the stiffness of the stock.

For this work the change in section has been corrected mathematically by multiplying the load in kilos per square

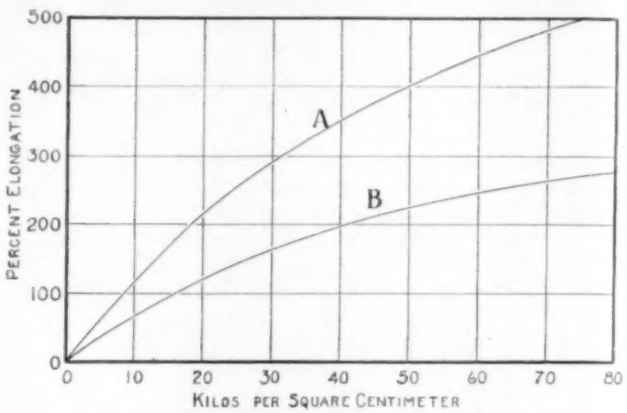

FIG. 2. CORRECTED STRESS STRAIN CURVES

centimeter of the original cross section by the elongation expressed by the English method, that is, in terms of the ratio of the extended length to the original length. This method assumes that the volume of the rubber remains constant. This assumption is proper even in the case of a compounded stock which shows an apparent volume increase when elongated. Such a volume change is due to the formation of small vaccua where the rubber is pulled away from the particles of filler and cannot be considered a true volume change of the rubber itself.

The equation for the corrected stress strain curve has been determined to be:

$$S = Ee + \left(\frac{e}{B}\right)^{\frac{1}{k}}$$

S = Stress corrected for decrease in section.
e = Elongation in per cent divided by 100.
E = Young's modulus.
B & k are constants.

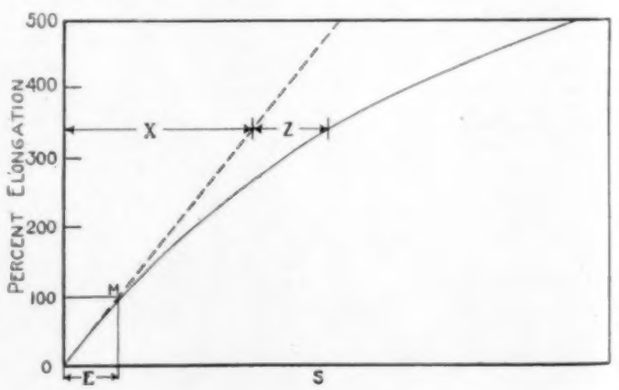

FIG. 3

The development of the equation may be understood by referring to figure 3. A line OD is drawn tangent to the

* Sur l' extensibilite du caoutchouc vulcanize' Comptes Rendus Feb. 6, 1911 p 320

† Published by courtesy of the American Chemical Society. Paper read at New York meeting, September 7, 1921.

curve at the origin. The abscissa of the point (M) where the tangent line crosses the 100 per cent elongation line is equal to the modulus (E). The equation for this line may be written $X = Ee$, in which X represents the horizontal distance from the Y axis to the line OD. The horizontal distance from the line OD to the curve is called Z. The distance Z plotted against e on log log cross section paper gives a straight line. The equation for Z in terms of e may therefore be written:

$$Z = \left(\frac{e}{B}\right)^{\frac{1}{k}}$$

In this equation k represents the slope of the line on the log log paper and B the ordinate corresponding to the abscissa with a value of one. As $S = X + Z$ the equation for the curve may be written:

$$S = Ee + \left(\frac{e}{B}\right)^{\frac{1}{k}}$$

This equation has been tested on curves representing stocks varying widely in composition and cure and no curve has been found for which it does not apply.

The values for the terms in the equation may be determined mathematically but the graphical method has been found to be generally more satisfactory. The chief advantage of the graphical method is that an error in the lower portion of the curve, where the greatest inaccuracy is found, may be detected by the graph on the log log paper. It has been found by

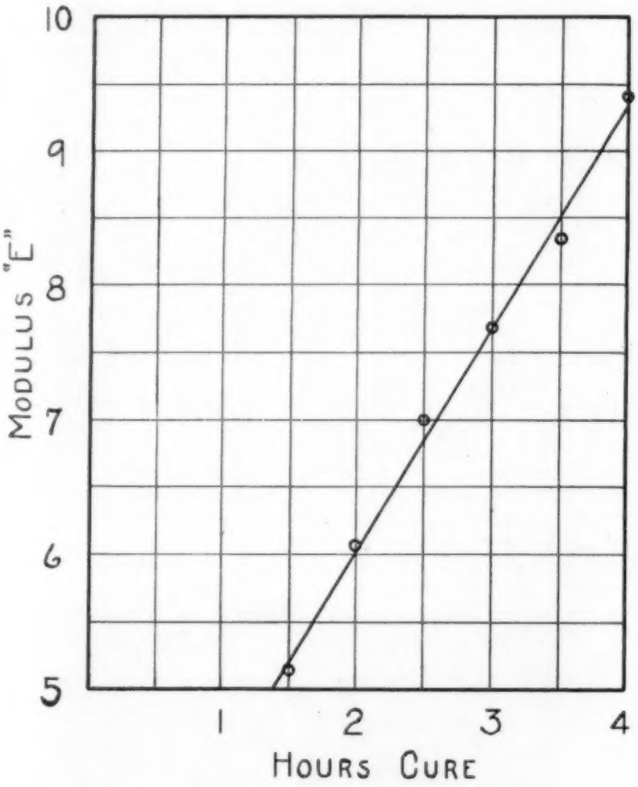

FIG. 4. CHANGE OF MODULUS WITH CURE

experience that when this graph is not a straight line either the position of the tangent has not been properly estimated or there is an error in the data.

The following data illustrates typical results secured by this method.

Compound C (See Fig. 4).

Hours Cure	E	B	K
1.5	5.2	1.95	.340
2.0	6.1	1.85	.308
2.5	7.0	1.70	.308
3.0	7.7	1.52	.301
3.5	8.3	1.50	.304
4.0	9.4	1.40	.308

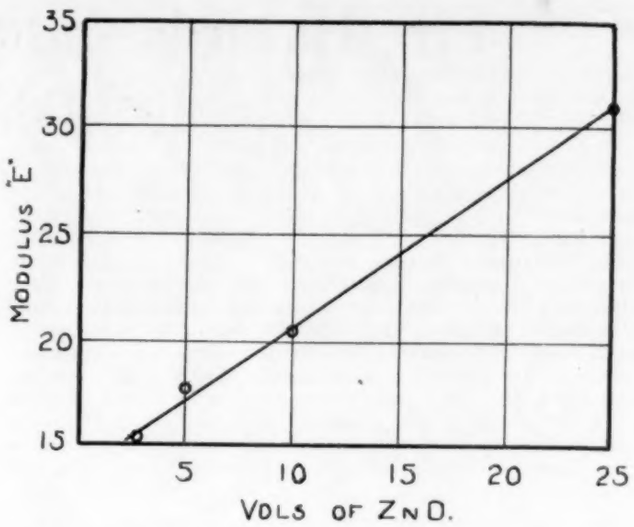

FIG. 5. CHANGE OF MODULUS BY INCREASING AMOUNT OF COMPOUNDING INGREDIENTS

Compound D (See Fig. 5).

Vol. ZnO per 100 vol. of Rubber	E	B	K
3	15.4	1.1	.296
5	17.	1.0	.296
10	20.6	.82	.296
25	31.6	.61	.302

Composition of these stocks were as follows:

Compound C:	
Fine Para	100
Sulphur	7.5
Cured	286°F.
Compound D:	
Pale Crepe	50.0
Smoked Sheet	50.0
Sulphur	6.0
Accelerator	.5
Zinc Oxide	3 to 25 Volumes
Cured 75 min. at	286°F.

It has not been possible to relate either of the constants B or k to a definite physical property of rubber. k has been found to vary from 0.25 to 0.35, and B from 0.6 to 3.0. k remains approximately the same for different cures of the same stock.

Summary

1. The commonly used stress strain curve does not represent the true physical characteristics of rubber.
2. A curve corrected for decrease in cross section shows the modulus to be least at smallest elongation.
3. The modulus determined from a corrected curve is an accurate measure of the stiffness of a stock.
4. The equation for the stress strain curve of rubber is

$$S = Ee + \left(\frac{e}{B}\right)^{\frac{1}{k}}$$

Testing Crude Rubber

The mixture of crude rubber and sulphur in the proportion of nine parts of the rubber to one part of the sulphur is made into sheets and these are wound about an aluminum mandril and vulcanized at a temperature of 138 degrees C. Samples are cut from this rubber and these are tested to determine the breaking strength, the load which will give an elongation of 800 per cent and the load which will produce an elongation of 900 per cent. Five samples are used in each test. The combined sulphur is determined. The standard conditions of the vulcanization are a vulcanization coefficient of 3 and a duration of 150 minutes, at the end of which time the sheets of the ordinary crepes give a coefficient which is in the neighborhood of 3. Several curves have been drawn to corelate the tests. See H. P. Stevens in the Bulletin of the Rubber Growers Association.

Fire Hazards and Static Electricity in Rubber Factories

By F. J. Hoxie

Engineer and Special Inspector, Factory Mutual Fire Insurance Companies, Boston, Mass.

Several years ago I visited a rubber factory where there had been a series of fires at the spreaders. The cement used was mixed with benzol and was very thin. The weather was cold, and the atmosphere was therefore dry. The foreman of the spreader room had dry skin and therefore could hold an electric charge for a long time as he did not give out moisture enough to locally humidify the air about his body. Whenever he brought his hand near the spread fabric on a cold day, a spark jumped from his fingers and frequently caused a fire.

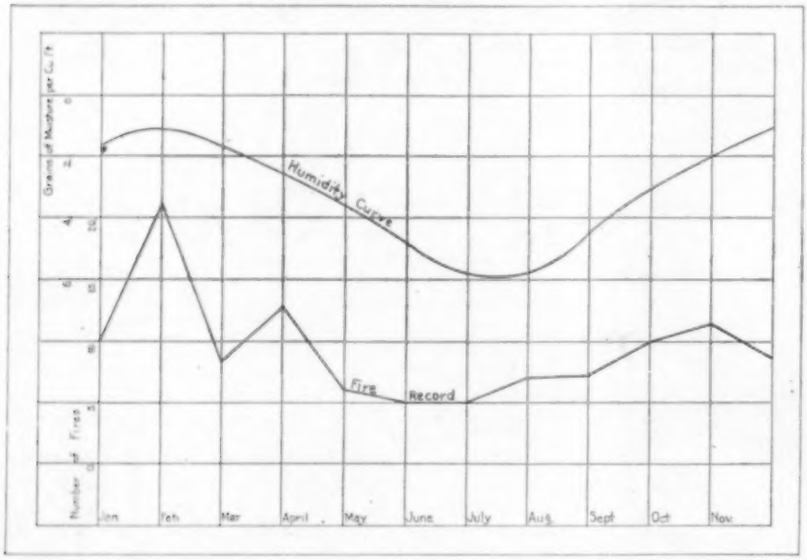

FIG. 1. CHURN ROOM AND SPREADER ROOM FIRES COMPARED WITH RELATIVE HUMIDITY CURVE (RECORD FROM N. F. P. A. QUARTERLY)

He was unaware of the spark or the atmospheric condition which caused it, but he was quite sure that fires were following him about in a mysterious manner and at the time of my visit this knowledge had brought about in him an unpleasant, nervous condition. He had tried all common remedies, such as working with all doors and windows open, a part of the galvanized iron roof of the spreader building had been removed to secure the best possible ventilation. While this removed some of the combustible vapors it also removed the moisture, making conditions worse.

Fires as well as accidents, are a matter of psychology as much as physics and chemistry. Not so many years ago all unexplained natural phenomena were attributed to supernatural causes. Witches having cast a spell about a milk pan caused it to sour the milk put into it. The deposit of bacteria hidden in an inaccessible crevice was unsuspected.

The thought of being in the control of an unknown supernatural power causes an unpleasant feeling of helplessness. The spreader foreman had such a feeling. I suggested that some pent cocks be put on the steam radiators and that they be allowed to blow steam into the air. I then took a piece of worsted yarn ,about eighteen inches long and held it over the cloth in front of the spreader knife.

Before the steam jets were put in operation it pointed rigidly at the charge on the fabric coming off the machine. When the atmosphere had been moistened by the steam the yarn hung limp. A wet and dry bulb thermometer was then placed in the room and by this instrument the amount of moisture in the atmosphere was shown. It was evident that when the atmospheric moisture dropped much below four grains of water per cubic foot of air, a charge appeared on the cloth. At once the uncanny condition was removed, that which had been supernatural became natural and was brought within human control.

It could be studied and the conditions which influenced it could be observed. The fact that not only the moisture in the air but the speed of the spreader had a direct bearing on the magnitude of the charge, was apparent; moreover cloth passed over the spreader with no rubber applied could be shown to have an electric charge, the same as the cement treated cloth, but in this case no fires resulted as there was no combustible solvent present to be ignited by the small spark.

I had previously shown in a paper given to the National Association of Cotton Manufacturers in September 1916, that a considerable number of the cotton picker fires follow the atmospheric humidity curve, there being more in the winter when the atmosphere is dry. This is doubtless caused by the greater ease by which the very dry cotton can be ignited by a small spark, this fact was taken advantage of before matches were invented in the use of dry cotton, called "tinder" for ignition with the flint and steel. Earlier still the Indians made use of dry punk wood for ignition by rubbing two pieces of wood together rapidly

Three-quarters of the rubber factory fires are caused by deficiency in atmospheric humidity as shown by the fire records of the time of year at which they occur. About 15 per cent of the cotton picker fires can be similarly attributed to this cause, as shown by the curves given at the end of this paper.

In both cotton and rubber manufacture the quality of goods can doubtless be improved by avoiding conditions of dryness

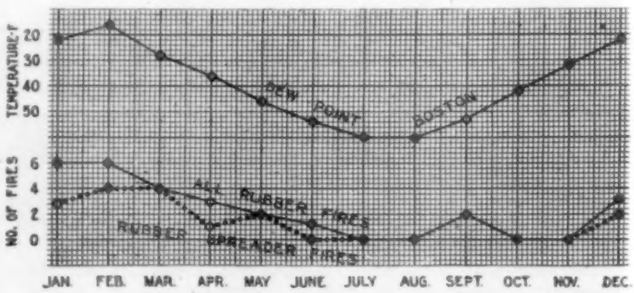

FIG. 2. DISTRIBUTION OF RUBBER FACTORY FIRES FROM FACTORY MUTUAL RECORDS

sufficient to cause fires. This fact will serve as a sufficient motive to induce the progressive manufacturer to study his product with reference to weather conditions. By such studies not only will the product be improved, but the hazard reduced.

Much of the "safety first" literature leaves the impression

Address delivered at Tenth National Congress, National Safety Council, Boston, Mass., September 26-30.

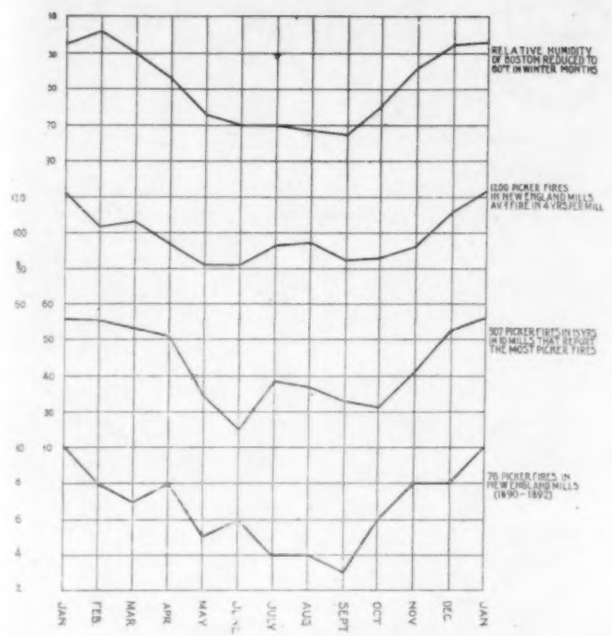

FIG. 3. RECORD OF COTTON PICKER FIRES COMPARED WITH THE HUMIDITY CURVE

that the chief object of such studies is altruistic and humanitarian and that virtue must be its own reward, but observation will show that the careless or ignorant persons who cause fires or personal injury, also cause loss of dollars long before the other results.

It will be of interest to study practical operating conditions with reference to the frequency of fires and in many cases it will be found that conditions which cause fires, produce defective goods and result in a smaller production.

The study of the smallest details of manufacturing operations has become necessary. Safety engineering is not an independent branch of social science but is closely associated with efficiency engineering and is being contributed to by the constantly increasing number of research laboratories maintained by manufacturing establishments. The ideas which can serve as profitable starting points for research work, can frequently be provided by the study of obscure causes of common fires and accidents and in establishing the relation between these causes and the amount of goods produced.

A comparison of fire curves, production curves, humidity curves, temperature curves and curves showing the prevalence of epidemic diseases and conditions contributing to the health and comfort of the employe, can show these factors to have a direct bearing on the production of goods. The following curves will give you an idea of the relations between fires and humidity in several industries and the practical results which such studies can lead to.

Since attention was first called to the relation between humidity and rubber fires, many humidifying appliances have been installed in rubber factories. Provision is being made for controlling the humidity of cotton picker rooms, and just now apparatus is being installed for *preventing* fires and decay in large piles of stored pulpwood by keeping it moist with artificial fog.

A Great Discovery - If True

From an editorial in the Straits Times, Singapore.

Some little time ago, a quiet young gentleman called on the Editor, and in a slightly foreign accent made a statement that he had solved the problem of vulcanizing rubber direct from latex. We tried to be genially tolerant though it was a busy hour, and we have had nearly as many solutions of the rubber problem as there are rubber trees in Malaya. But our young friend caught our interest and attention in a few moments. We assumed the role of "Devil's advocate," pointing out every objection we could think of, but that young man had considered them all and had very good answers ready, and our heart warmed toward him. Yesterday we received two shoe soles and a sample of what is called ebonite, They are produced direct from latex at about the same cost as the same quantity of crepe or smoked sheet could be produced. In other words 48 hours after latex leaves the tree it is ready for export as a manufactured article. Of course the work at present is being done with very primitive appliances, but what amazes us is the quality of the material, the simplicity and the economy of the process. We are not technical experts, but men who have seen the product are deeply impressed with it, and at a time like this when the supreme need of this country is new industries, and new uses for rubber, and when the average man's heart is in his boots this new thing appears to us to be worthy of the most serious consideration. Suppose we can send millions of shoe soles to the United Kingdom and the United States as cheaply as we could send Singapore standard sheet. Suppose this discovery opens up possibilities of new uses—those concerned are already experimenting on paving and other things. For the moment we are not at liberty to disclose any details but the men concerned are hard headed solid citizens, not easily led astray, and they are amazed at the results which have been obtained. There was a reference the other day to the need of new industries, and even to the manufacture of goods from rubber in the Chief Secretary's annual report. That shows keenly intelligent appreciation of necessities such as we should expect from Mr. Maxwell.

You cannot export latex. The present system is to turn latex into crepe or sheet, then to export it to countries where all the prettiness it presents in the auction room is destroyed by the manufacturer, who churns it up without mercy. If we can take the latex and produce from it a finished article, at the same cost as we produce sheet and crepe we eliminate the cost of manufacture here and the cost of manufacture somewhere else. We cheapen the goods to the producer, and the effect of cheapening is to increase consumption. We introduce new industries which may rise to gigantic proportions because we can practically secure monopoly of the manufacture of a great variety and quantity of rubber goods. We do not want to raise false hopes but, we do want to impress upon everyone the importance of bringing new business to this country—especially new business which will fit in with the greatest of our existing industries. The point of the whole thing is that if rubber goods can be made direct from latex it can only be done in countries where the rubber grows, and countries which have to take the rubber overseas in the form of sheet, crepe or block, would have a poor chance of competing against us. The inventor of the process has given profound attention to his problem. Most students have been content to strive after a simpler or cheaper way of coagulating latex in order that it might be exported for manufacture elsewhere. Our young friend cut out the intermediate processes and expenses. Of course there will be keen competition with existing interests, but manufacturers know what business means. Recently we were conversing with a shrewd American. "Why," we said "do you insist on making all your tires in America?" We have fibres here that would make splendid lining, and we have the rubber around us. "Well," our American friend replied, "prove to our boys that you can do it cheaper here and they will scrap all their plant in America and set up business in Malaya." That is the spirit of real enterprise. Prove that it is cheaper—eliminate all expensive intermediate process and you have done it, and there is where the importance lies of the invention we are privileged to be first to announce.—

Safety First from the Factory Manager's Viewpoint

By Charles B. Whittelsey

President, The Hartford Rubber Works Company, Hartford, Conn.

The function of a factory manager is to produce an article of the highest quality in the greatest quantity at a minimum cost. The principal means at his command for producing are equipment, material and labor; and it is the problem of saving of the lives and limbs of his laborers that is the subject of this paper.

To consider the factory manager's viewpoint of safety we must assume that he has already been sold on the proposition and fully realizes the importance of safety in relation to his problem of obtaining high quality and maximum quantity at minimum cost. He must believe in "Safety First" both from the humane and from the economical viewpoint, and to such an extent that he has its problems always before him.

Fundamentally, the problem resolves itself into the task of selling the idea of "Safety First" to every man in the organization. It is just as necessary to sell this idea to the workmen as it is to provide him with the right materials and the proper tools.

But the factory manager requires patience. He must not forget that the process by which he—one of the minority of factory managers—learned that accidents are really preventable, was exceedingly slow. He must remember that the minds of his foremen and workmen are fixed on turning out production and not on the numerous details incidental to that production. He has but to look back and see how he felt after he first placed guards around belts, gears, saws and knives, covered openings in floors, and installed gates on elevators, etc., thus reducing the percentage of accidents, in order to realize that his entire organization, from superintendents to sweepers, must be sold on this proposition before the satisfactory results of a "Safety First" campaign can appear.

The factory manager, then, must, first of all, understand that "Safety First" is an educational movement, and that from seventy per cent to eighty per cent of the accidents in industry are due to lack of proper training of the operators.

The best medium the factory manager has for reaching his workmen is through the foremen, and therefore the foremen must be sold on the problem. In many cases a foreman assumes that because every belt, gear and machine in his department has been safeguarded, his work in the campaign is finished.

But the factory manager must make sure that the foreman's education is carried still further. The foreman must be shown the necessity of studying the personnel of his department, because men of a congenial type work better and more carefully together. He should see that all minor accidents, such as cuts and bruises, are investigated and the operator carefully instructed so that similar accidents may be avoided in the future.

The foreman must be brought to realize the importance of his instructions from the economical standpoint. An operator who has been fully instructed in his work feels assured that, by doing his work correctly, he will avoid injury; therefore he is certain to be more content and consequently in a better mental and physical condition, and is thus enabled to work more efficiently and to his utmost earning capacity. This favorable condition is reflected in the man's work, and results in high quality, uniformity, maximum quantity and low cost to the company.

But the foreman must think beyond the production capacity of his men and machinery and must see the human side of the question. By his careful instructions on "Safety First", he reduces the amount of suffering and disability among his men, prevents them from losing time and saves their families from distress, thus proving himself not only a faithful servant of the company but a true friend to his men.

The factory manager finds that his employment department can be of great assistance in reducing the number of accidents, if the employment manager is thoroughly familiar with the operations in the various departments in which he is to place the men.

The factory manager will soon see a shorter accident list if his employment manager makes a careful analysis of each job, and uses this analysis in his placing of employes. The wise selection of employes is of prime importance; but the careless placing of light men on heavy jobs and heavy men on light jobs, the putting of men of muscle and brawn in positions where brains and dexterity are required, is a most fertile source of accidents.

Another valuable ally in the factory manager's "Safety First" campaign is the first aid department. Every injury, no matter how slight, should be reported to the first aid department, so that it may receive proper treatment and serious results may be prevented.

This department should maintain complete accident records in which each accident is traced back to its actual cause. The statistics thus accumulated will be of great value in determining the chief causes of accidents, and will serve as a guide to the factory manager in planning his "Safety First" campaign.

The first aid department, should, of course, be under the direction of medical authorities, with trained nurses in attendance. Heavy losses often occur from the lack of proper first-aid attention.

Sometimes the factory manager discovers that, though the officers of his company desire to reduce accidents, they are unwilling to spend sufficient money to carry on the educational work after the mechanical safeguarding devices have been installed. Under such circumstances the factory manager's efforts are in vain until he has changed the direction of his program of education from his foremen to the officers and directors of his company. But let him see to it that, when he goes to his board of directors he arms himself with telling statistics and indisputable facts well backed up with quenchless enthusiasm for Safety First.

In conducting the "Safety First" campaign, the factory manager requires a right-hand man to whom the actual details of the work may be entrusted. From what department this man is chosen matters little, provided he possesses in addition to his other qualifications, the supreme gift of leadership.

This safety director need not devote all his time to the campaign, but upon him devolves the duty of organizing a *live* "Safety First" committee through which the educational work is carried throughout the plant.

The committee must be allowed time to inspect the various departments and to get in touch with the foremen. It is not to be expected that the members of this committee can do their work effectively unless they have an opportunity to inform themselves on the subject; therefore all available literature dealing with the prevention of accidents should be placed by the company in the hands of the committee.

Upon the safety director and his committee rests the important work of so infusing the "Safety First" idea into the minds of the foremen, and, through the foremen, into the minds of the operators, that a spirit of hearty cooperation will be engendered.

By inducing the foremen to set up a friendly rivalry among departments in their efforts to reach the zero mark in accidents, and by stimulating department pride, it is possible to inject the new ideas into the operators' minds.

The Safe Operation of Reclaiming Plants

By John C. Baker

The Rubber Regenerating Company, Naugatuck, Conn.

There is a similarity between reclaiming and other rubber plants, notably so in the arrangement and equipment of the mill room. There, we have the same style of mills driven individually, or in groups; the mill operator is protected against accident by an approved magnetic, mechanical or pneumatic clutch on each mill line shaft, with some form of brake, the clutch is thrown out and the brake engaged by the conventional trip over each mill.

The similarity is not so pronounced outside the mill room, there being some features connected with reclaiming that require careful consideration for safe operation. One of these features is the handling of materials. Wherever possible, rubber in process is conveyed by power or by gravity, but there is always more or less trucking by hand, and this trucking and handling of materials accounted for forty-three per cent of the accidents in one plant for one year. The general run of these accidents was slight to be sure, but occasionally a bad strain was the result, a foot bruised or a toe crushed. Many of these accidents could have been avoided if electric transveyor trucks had been in use; these are rapid in action and considering the number of hand trucks they replace, safe in operation. The inclination is to overload them, it is, therefore, important before the trucks are placed in service to look into the condition of the floors to determine if they are sufficiently strong to carry the additional concentrated load.

A large stock of raw material must be available at all times. It is received in a variety of bales, bags, boxes and in loose condition. Bales, weighing from 1200 to 2400 pounds, are packed tightly in the cars, and their removal in regard to safety to the operators has occasioned considerable discussion. Many ways and means have been suggested, but as yet, nothing has been found to supersede the hand bale truck.

Regarding Equipment

Most of the raw stock is stored in the open thus reducing the fire risk, and avoiding the use of large buildings for storage purposes. The storage piles should be served by a light travelling or stacking crane, or a monorail conveyor.

In regard to equipment: Devulcanizers and jacketed digesters are provided with safety valves, the same as the safety standards for vulcanizers. Digesters of the single shell type, where the steam comes in contact with the rubber and caustic, will, at times, due to chemical reaction, run a higher temperature and consequently pressure, than that furnished by the boilers. To protect the vessel, a safety valve is placed in the entering steam pipe and close to the stuffing box; check valves between the safety and steam valves prevent the excessive pressure generated in the digester from blowing the rubber and caustic into the steam main, and thence to boiler. The reason for locating the safety valve in the pipe, rather than in the shell, is that, if in the former position, it can be tested while the digester is revolving; it also keeps free from an accumulation of rubber, whereas a valve in the shell would soon become plugged and rendered inoperative.

Revolving digesters and devulcanizers should be provided with locks to prevent their turning while being repaired or cleaned. A satisfactory lock is the ratchet and pawl type. The ratchet is made in halves and bolted to the trunion of the digester, the pawl engages teeth in the circumference of the ratchet.

Tubing machines, or, more properly speaking, straining machines, as the latter only are used in reclaiming, are provided with a straining head, which, for an 8 inch machine, weighs approximately 100 lbs. The head is screwed into the body of the machine and has to be changed several times during the course of the day for the purpose of cleaning the screen.

The style of wrench used to remove the head is important; a spanner or box wrench will in time slip, due to the rounding off of the corners of the head, or the corresponding corners of the wrench, often resulting in an injury to the operator.

A wrench with a friction grip, similar to a Parmelee pipe wrench, can be used with a greater degree of safety than any other style. It will tightly grip without marring the smooth cylindrical surface of the head, and as it requires no protuberances to fit over, the head can be of minimum weight, consequently more easily and safely handled.

Preventing Accidents

For several years past there have been no accidents due to the operator's hand or fingers being caught between the worm and body of the machine. To prevent accidents of this nature, a practice is made of using a stick to feed the stock, or for the operator to keep his thumbs outside the throat, thus preventing his fingers from coming in contact with the worm.

Bucket elevators and conveyors of all kinds should be provided with locks. The usual method is to lock the belt shipper, or handle of starter if driven by motor, and the man cleaning or repairing the conveyor to keep the key in his possession.

Batching and sheeter mills are now equipped with automatic aprons. With mills so equipped, it is not necessary for the operator to keep his hands on the rolls, thereby reducing the number of mill accidents. In some cases, mills are arranged in groups and connected by conveyors. For instance, if a certain stock requires four passes, it is fed to the first mill, and automatically delivered to the other three. This arrangement, similar to the automatic aprons, dispenses with the dangerous practice of feeding by hand.

Three per cent of the total injuries during one year in one plant were caused by caustic or acid burns; the record does not give the proportion, but the former predominated.

The uusal method of opening the caustic drums or containers is by means of a sledge-hammer, or pickaxe, the caustic is broken in the same manner.

A pneumatic rock drill permanently supported with a hammer in place of the drill has been used with some success, but as yet, it has not been determined as to how it compares from a safety point of view with the old method of breaking with a sledge.

Sulphuric acid is received in tank cars and is delivered to the storage tanks by gravity or by compressed air, and pumped from the storage to the boiling tanks. In all cases it is piped. Carb oys, or other containers with their attending danger of handling should not be tolerated.

Address delivered at The National Safety Council Convention, at Boston, Mass., September 26 to 30, 1921.

Acceleration of Vulcanization

Societe R. Allenet et Compagnie have been granted a patent on the use of accelerators in the vulcanization rubber. (see British Patent No. 157,050). Furfuramide and other nitrogen derivatives of furfuryl are used for this purpose. Several furfruyl derivatives in addition to furfuramide are mentioned, in particular the condensation products of pyromuoic aldehyde with ammonia or amines.

Tires Reinforced with Helical Wire

British Patent No. 165,128 is concerned with the manufacture of a tire which is reinforced with strips of flattened wire helices. This band of wire is built right into the foundation of the tire and imbeded in the rubber between the layers of fabric. The wire strips may extend transversely, obliquely or circumferentially through the tire. In the case of heavy tires two such bands may be used with the wire strips crossing.

ABSTRACTS

Technical — General — Commercial

Tire Vulcanizer

United States Patent No. 1,386,465, which has been assigned to The B. F. Goodrich Co., is concerned with an apparatus and method of vulcanizing or partly vulcanizing pneumatic tire casings by the application of a heat carrying fluid to the interior and exterior of the casing.

The aim of this patent is to overcome the disadvantage of the old method of tire vulcanization, in which the heat was applied to the tire through the outer mold, whereby an imperfect product resulted from the distortion and buckling of the fabric, due to the flow of the tread rubber under the pressure of the mold. The new method also prevents the swelling of the rubber during the process of vulcanization, which is caused by the expansion of gases or air imprisoned in the rubber.

The apparatus is a vertical heater press which is provided with a ram with a specially designed head at its lower end. Within the partly hollow head there is a steam trap and an outlet pipe through which the steam escapes into the heater press chamber. The chamber is cylindrical in form and surrounds the whole press. The tire molds are stacked up on the flat plate forming the top of the hollow head. The fluid pressure enters at two points in the apparatus. At the upper side there is an opening which admits the pressure to the outside of the molds and at the very top of the apparatus there is another opening, which admits the fluid pressure to the interior of the molds, where it is communicated by proper means to the core cavities and from the latter to the inner surfaces of the tires. Steam also enters the inner parts of the molds through a suitable pipe leading from the steam trap within the hollow head. Suitable outlet vents are provided for the outlet of the fluid pressure.

The steam pressure softens the rubber and facilitates the expansion of the tire. The pressure is applied to the inner chamber first. When the desired expansive action has been secured within the cores of the molds, then the pressure is applied to the external part of the tires. Heat sufficient to soften the rubber in the outer parts of the tires may be applied while a relatively high air pressure is applied to the inner chamber to expand the tire.

Rubber Substitute for Glue and Glycerine

An application has been made for an Austrian patent on a process of making rubber substitute from glue and glycerine. (Application No. A 5773-17). To the mixture of glue and glycerine there are added different inert materials. The mixture is oxidized by means of chromic acid or the double salts of chromic acid in the presence of light if necessary. It was found that the influence of light during the oxidation diminished as the quantity of oxidizing material used increased, and in the making of masses which are not to be vulcanized and which contain large amounts of the oxidizing agent, the light is cut off altogether. The quantity of the oxidizing agent determines whether the product can be vulcanized or not. In the case where an unvulcanizable material is desired about one and one half to a maximum of three per cent of the oxidizing agent on the weight of the glue in the mixture should be used.

New Rubber Substitutes Free from Sulphur

Norweigan Patent No. 29,446 deals with a method of making a rubber composition which does not contain any sulphur. The raw material is a metallic compound of a fatty acid, which may or may not be dissolved in a hydrocarbon at its boiling point. This mixture is treated with an oxidizing agent dissolved in a drying oil heated to 200 to 250 degrees C.

Ebonite and Vulcanite Substitutes for Blood

British Patent No. 165,832 is concerned with a process for the use of ox and other animal blood from slaughter houses to make plastic solid or moldable substances which may be used for a great variety of useful purposes, as substitutes for ebonite, vulcanite, horn and other similar materials.

Before the coagulation process, the blood is first dehydrated either partially or wholly by being heated to a carefully regulated temperature which must not exceed 120 degrees F to any great extent. During the early part of the dehydration operation the blood is exposed to the air as much as possible. It is well to rake the mass over a number of times so as to make sure that every part of it gets this air treatment. Subsequently it is coagulated by means of heat or chemical agents. The addition of calcium hydrate during the stage of the process in which the dehydration takes place will result in tougher ultimate product. Various oxidizing compounds may also be added to the mixture.

Two blood products are obtained, one solid and the other liquid. In making the ebonite substitute various proportions of the two are used and different absorbent or filling materials are added and the whole is mixed very thoroughly to a stiff mass. The coagu'ation takes place by the addition of a coagutant or by the use of heat. The drying is accomplished with or without the application of external pressure. If there are any cracks or fissures in the finished product, these are removed by the application of more heat and pressure. If in the preparation of the liquid product more than 2 per cent of 40 per cent formaldehyde solution has been used, it is found that the product will thicken too quickly as it is being poured into the mold. If too much has been added then the proportion must be reduced to the proper amount to give the best results. The blood is allowed to dry out to a solid mass in the mold, which is accomplished by merely exposing it to the air. In the manufacture of insulating material, resins gums and oils are incorporated with the mixture and then the whole may be worked up, into any desirable form or shape.

Artificial Hard Rubber Masses

Austrian Patent No. 82,803 is concerned with a process for manufacturing hard rubber products which contain phenol formaldehyde condensation products. Different varieties of these products are used in conjunction with cellulose xanthate, which has been freshly prepared. This point is important, for if the xanthate has been allowed to stand for any length of time, it is found that an inferior product is obtained. The mixture of these two materials is thoroughly worked up between ordinary rubber rollers and then it is carefully washed in order to remove the salts which are injurious to the final product. The next step in the process is to heat the mass to a high temperature. The product, that is obtained in this manner, is then mixed with crude rubber, various mineral or organic fillers and sufficient sulphur to vulcanize it thoroughly. The vulcanization is carried on generally under pressure. The final product resembles hard rubber or ebonite very closely and possesses most of its properties, while being considerably cheaper. It may be used for most of the purposes for which regular hard rubber is employed and gives very good results.

Reclaiming Rubber

In Norweigan Patent No. 31,274 the reclaiming of rubber is accomplished by rolling out the rubber in the thickness of a film at least twenty times. In this way the rubber is opened out and may be used again. It may be vulcanized either by itself or in conjunction with new rubber or fillers.

NEWS OF THE INDUSTRY

News -- Personals -- Financial -- Building Activities -- New Products

Rubber Goods Exports Below 1921 Average

During the first nine months of 1921 the United States exported manufactured rubber goods valued at $24,390,212, which averages $2,821,134 per month. During 1911 rubber goods were exported at the rate of $1,058,433 per month, and by 1913 this monthly average had advanced to $1,138,354. Thereafter the monthly average of rubber goods exports has stood as follows: 1915, $2,034,408; 1917, $2,899,028; 1919, $4,488,805.

Figures just issued show that during September, 1921, rubber goods were exported to a total value of $2,099,007, from which it will be seen that the month stands below the average for 1921, and, disregarding price changes, about on a level with 1915.

Too much attention should not be paid to the figures for any one month since they may be distorted by unusual ship-trade. Fluctuations may be due to various things which spoil the value of the figures as market indicators.

Rubber Footwear Records Further Gains

The mechanical rubber goods group, consisting of belting, hose, and packing, shows September as its lowest month of 1921. The total September exports for the three classes were valued at $195,850. Packing made a gain in the month, but not to an extent to offset the substantial loss in hose and the smaller one in belting.

Rubber boots and shoes continued to gain in September, 46,435 pairs of boots and 211,227 pairs of shoes being exported. The former were valued at $103,789, and the latter at $186,613. On a basis of value, September stands as the third best month of 1921. The export value of druggists' rubber sundries advanced to $61,773 in September.

Tires and Soles and Heels Show Slight Changes

All classes of automobile tires show slight declines, casings losing more than either tubes or solid tires. Exports of these items in September were valued as follows: Casings, $940,333; tubes, $97,528; solid tires, $97,523. The class "all other tires," which contains bicycle and motor cycle tires, rose $4,000 over August to a total of $26,574.

Soles and heels also gained approximately $4,000 over August and showed an export value for September of $31,058, which stands at about the average for the year. Various other lines of rubber manufacturers, grouped under "all other manufacturers of rubber," also showed moderate gains.

Will Only Make New Tires

After January 1 the Cooper Corporation of Cincinnati will confine itself solely to the manufacture of new tires. A new corporation known as the Giant Tire Company of Delaware has been incorporated to produce rebuilt tires with a capital of 30,000 shares of no par value common stock, of which 15,000 shares are designated as common stock and 15,000 shares as founders stock.

C. E. Hart, who as President has been with the rebuilt business from its inception, retires as Vice President of the Cooper Corporation to accept the Presidency of the Giant Tire Company.

Mr. Reynolds, who was Secretary and Treasurer of the Giant Tire and Rubber Company before it was absorbed by the Cooper Corporation, retires as Treasurer of the Cooper Corporation to accept the same position with the new company.

The McKone Organization

The McKone Tire & Rubber Company has recently been organized with factories at Millersburg, Ohio, and general offices in Chicago, to manufacture McKone fabric and cord casings and inner tubes.

The officers of the company are: A. L. Gustin, President. Chicago; C. W. Mc Kone, Vice President and in charge of production, Millersburg; L. C. Conley, Secretary-Treasurer; O. S. Tweedy, Manager of Sales, Chicago.

The organization of the McKone Company is particularly interesting from the fact that the output over a period of years is largely sold in advance, and from the fact that the distributors are not only interested in the disposal of the output, but are also substantial stockholders in the parent company.

Among the large distributors are: The Conley-Hussey Company, Chicago; Gustin-Bacon Mfg. Co., Kansas City, Mo.; E. J. Methudy, St. Louis, Mo.; others of equal prominence.

New Goodyear Branch

A branch of the Goodyear Tire and Rubber company will be opened at 55 Eighteenth street, Wheeling, W. V., early in November. Wheeling will be wholesale distributing point for that portion of West Virginia and Ohio, formerly in charge of the Pittsburgh district.

Rubber Firm to Cut Wages

The Boston Woven Hose & Rubber Co. have reduced wages and salaries from 5 per cent to 15 per cent, affecting every department in the company.

Rubber Importations Show Large Increase

The Rubber Association of America, Inc., has issued its bulletin of importations of crude rubber into the United States during October. The figures show that the imports were more than 120 per cent greater than those of October 1920.

The statistics in detail are as follows:

PLANTATIONS

From	Tons
Batavia	659
Belawan-Deli	1,485
Cochin	58
Colombo	2,541
Japan and others	419
Liverpool	18
London	1,462
Malacca	264
Penang	390
Pt. Swettenham	99
Rotterdam	3,196
Singapore	10,772
Sourabaya	239
	21,602

AFRICANS

From	Tons
Africa	3
Antwerp	38
Liverpool	13
St. Nazaire	820
	874

CENTRALS AND GUAYULE

Centrals (Mexico and Central America)	3
Guayule (Mexico)	
	3

PARAS

Manaos	536
Para	454
	990

GUMS, WASTE RUBBER, ETC., IMPORTED FROM VARIOUS SOURCES

	Tons
Waste	17
Balata	45
Miscellaneous Gums	400

COMPARISON 1920-1921	Oct. 1920	Oct. 1921	Total Importations ten months ending, October 31. 1920	1921
Plantations	8,759	21,602	181,561	131,748
Paras	1,613	990	16,586	9,402
Africans	27	874	3,783	1,646
Central	17	3	690	78
Guayule	223	—	957	58
Manicoba and Matti Grosso	—	—	35	3
	10,639	23,469	203,612	142,935

ARRIVALS PLANTATIONS FOR OCTOBER, 1921, SHOWING PORTS OF ORIGIN AND ARRIVAL

From	Arrived at	Tons
Batavia	New York	659
Belawan-Deli	New York	1,485
Cochin	New York	58
Colombo	New York	2,541
Japan and Others	New York	419
Japan and Others	Baltimore	196
Liverpool	New York	18
London	New York	1,462
Malacca	New York	264
Penang	New York	390
Port Swettenham	New York	99
Rotterdam	New York	3,196
Singapore	New York	10,534
Singapore	Seattle	42
Sourabaya	New York	239
		21,602

ARRIVALS OF PLANTATIONS BY PORTS

Atlantic Ports		
New York	21,364	
Baltimore	196	
		21,560
Pacific Ports		
Seattle	42	
		21,602

Interesting Facts and Figures

Statistics Covering the First Six Months of 1921 Compiled from Questionnaire—Interesting Report from 66 Tire Manufacturers—Automotive Industry Holds Its Own

STATISTICS COMPILED FROM QUESTIONNAIRE

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	Reported by Manufacturers who also Reclaim (30)	Reported by Reclaimers Solely (8)	Total
Reclaimed rubber produced from raw and cured scrap *pounds*	14,709,461	18,817,845	33,527,306
Scrap rubber (including raw and cured scrap) consumed in production of reclaimed rubber, ... *pounds*	20,074,215	25,595,209	45,669,424

NUMBER OF POUNDS OF CRUDE RUBBER CONSUMED IN THE MANUFACTURE OF RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS OF MANUFACTURED RUBBER PRODUCTS

Product	Number of Pounds Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries:		
Automobile and motor truck pneumatic casings	75,863,102	$186,898,983
Automobile and motor truck pneumatic tubes	18,025,602	24,776,850
Motorcycle tires (casings and tubes)	154,548	585,876
Bicycle tires (single tubes, casings and tubes)	480,964	1,512,985
All other pneumatic casings and tubes, not elsewhere specified	1,014,140	2,022,778
Solid tires for motor vehicles	6,395,213	9,919,532
All other solid tires	120,884	459,475
Tire sundries and repair materials	1,845,488	5,306,236
Total—Tires and tire sundries	103,889,941	$231,482,605
Other rubber products:		
Mechanical rubber goods	11,020,417	$34,475,894
Boots and shoes	10,254,260	41,386,097
Insulated wire and insulating compounds	771,178	4,453,754
Druggists' sundries, medical and surgical rubber goods	1,285,438	5,245,416
Waterproof cloth, clothing, and rubber sheeting	1,439,175	5,524,199
Hard rubber goods	852,593	2,008,626
Miscellaneous, not included in any of above items	2,456,359	6,741,283
Total—Other rubber products	28,079,420	99,835,269
Grand total—All products	131,979,361	$331,317,874

INVENTORY OF CRUDE RUBBER IN THE UNITED STATES AND AFLOAT FOR U. S. PORTS

JULY 31, 1921

On hand	Long Tons
Importers and dealers	15,030
Manufacturers	58,188
Total on hand	73,218
Afloat	**Long Tons**
For manufacturers and importers and dealers	24,352

[1] The number of rubber manufacturers reporting data for the first half of 1921 was 239, plus 94 (see note); the number of crude rubber importers and dealers reporting data was 56; and the number of reclaimers (solely) reporting data was 8. The total daily average number of employees, on basis of third week of January, 1921, was 110,104.

Important Note—In addition to the 239 firms who actually supplied data, the questionnaire developed that a total of 94 companies recently listed as rubber manufacturers are either out of business or are jobbers of rubber articles. Consequently this compilation may be considered as embracing 333 companies.

Automotive Industry Holds Its Own

Figures made public by the Motor and Accessory Manufacturers Association, based on the official monthly financial survey, indicate that during September the automotive industry held its own.

Sales of parts and equipment, as reported by three hundred representative manufacturers dealing with the principal car and truck makers, declined 1.09 per cent during September, as against August. In the two preceding months increases of 1 per cent had been registered, and in June, there had been a 15 per cent drop.

The temperature chart of the industry, determined by the dead-reckoning financial and credit reports received at Association headquarters, therefore continues to maintain a healthful level, despite seasonable obstacles and the many factors in the general business situation retarding sales.

With respect to the total past due accounts of the automobile passenger car and truck manufacturers, as reported by their units and parts-suppliers, the curve is virtually constant, the exact change being an increase of twenty-two hundreths of one per cent during September. The totals of notes outstanding, however, increase approximately five per cent.

The percentage changes for the last nine months follow:

COMPARATIVE FIGURES FOR 1921

MONTH	PER CENT CHANGE*	PER CENT CHANGE**	PER CENT CHANGE***
February	66.15 Inc.	17.07 Dec.	37.08 Inc.
March	93.30 Inc.	16.57 Dec.	16.38 Dec.
April	32.93 Inc.	4.49 Dec.	5.94 Inc.
May	00.13 Inc.	15.64 Dec.	16.77 Dec.
June	15.19 Dec.	4.79 Inc.	10.37 Dec.
July	1.68 Inc.	10.79 Inc.	7.90 Dec.
August	1.31 Inc.	17.06 Dec.	5.30 Dec.
September	1.09 Dec.	00.22 Inc.	5.24 Inc.

* Purchases of parts, units, equipment, etc. by automobile passenger car and motor truck makers from 300 parts and accessory manufacturers by months— per cent change.

** Totals of past due accounts reported— per cent change.

*** Totals of notes outstanding—per cent change.

August Tire Exports Show Large Increase

The report of sixty-six American tire manufacturers to the Rubber Association of America shows that the exports for August of inch-sized automobile casings were greater than for any previous month in the year, in fact there was a decided gain as the following figures will show: March, 32,410; April, 27,221; May, 26,639; June, 37,772; July, 35,121; August, 48,561. The number includes all inch sizes in both straight- side and clincher types.

Of the 48,561 casings exported in August 36,252 were fabric and 12,309 were cord. Of the fabric tires 29,018 were of the clincher type and 7,234 of the straight-side type. Of the cord tires only 2,119 were of the clincher type and 10,190 were straight sides. The ratio would run as follows: Fabric clinchers, 59,8 per cent; fabric straight sides, 15.1 per cent; total fabrics, 74.9 per cent; cord clinchers, 4.1 per cent; cord straight sides, 21 per cent; total cords, 25.1 per cent.

The clincher cord casings exported were all of size 30 by 3½, with the exception of 6 casings, which were 31 by 4, and 15 which were 37 by 5. The diversity of sizes in the clincher fabric casings was much greater.

Important sizes of straight-side cord casings exported were 32 by 4, 33 by 4, 32 by 4½, and 34 by 4½. The list of sizes demanded in this class increases steadily, 20 casings in the new straight-side size 31 by 4 being exported.

August Tire Exports

The number of sizes of fabric straight-side casings demanded shows a tendency to decline. Five-inch sizes, other than 35 by 5, are selling irregularly and do not appear at all in the report for August. Sizes 33 by 4 and 32 by 4½ accounted for approximately five-sevenths of the straight-side fabrics sold.

The exports of tire equipment in metric sizes was much smaller than those offering inch size equipment; reports from twenty-six companies showing only 6,795 casings.

Twenty-three manufacturers reported the export of 3,035 inner tubes in metric sizes during August, sizes being demanded in fairly true proportion to those noted in metric casings sales. Sixty-four manufacturers reported the export of 36,692 tubes in inch sizes.

Eleven companies, who make practically all the solid tires manufactured in the United States, reported the export of 2,600 solid tires in 28 sizes, popular ones being 36 by 5, 36 by 4, 34 by 4, 40 by 6, 34 by 5, 36 by 8, and 36 by 6. Of solid tires in metric sizes 1,306 were exported in August by four manufacturers, popular sizes being 880 by 120, 1010 by 120, and 1050 by 120.

Rubber Restriction Fails

Insufficient Support Causes the Breakdown of the Ambitious Scheme of the Rubber Growers Association of London to Control 2,200,000 Acres of Planted Area

The Rubber Growers Association of London has failed in its efforts to control through the formation of a Rubber Growers Corporation the production and price of rubber.

"Insufficient support" is what caused the breakdown of the most ambitious plan ever put forth in the interest of the rubber business. It involved nothing more nor less than the control for five years of 2,200,000 acres of planted area.

Only 269 producers operating in Malaya, South India, Burma, Borneo and Netherlands Indies and representing 769,306 planted acres, out of a total of 3,323,000 acres, or less than 25 per cent, sent provisional letters indicating approval of the principles of the scheme. Of a total of 445 members of the Rubber Growers' Association domiciled in Europe, representing a planted area of 1,063,598 acres, provisional support of the scheme was received from only 236., representing 552,107 acres. There were 52 companies with a planted area of 129,547 acres that definitely refused to join the proposed corporation and 157 with a total of 351,944 acres made no definite reply.

Frank G. Smith, Secretary of the Association in a circular explaining the cause of the failure states that a substantial section of producers in Britain and in Holland are strongly against any form of control which would interfere with their own discretion, either as regards production, extension of planted acreage or any other matters. Others favor restriction only if made compulsory by legislation. Many private owners and local companies in British Malaya especially, would welcome restriction on condition that financial assistance is provided for those who require it. A large body of directors and shareholders mainly in Britain have indicated their willingness to sink minor criticisms and to support the formaton of a rubber producers' association in the interests of the rubber plantation industry as a whole. Unfortunately, it is added, the influence of the last named is not sufficient to move other European owners to a recognition of the value of united action. There is also a very large number of native owners who together control more than 500,000 acres of plantation rubber, and it seems impossible to bring them into any voluntary scheme for mutual benefit.

In conclusion Secretary Smith says:

> It is to be greatly regretted that the proposal to combine the interests of rubber growers in a Corporation having power to restrict production and control sales should have failed to secure the necessary support, for the situation confronting the industry remains grave. Apart from the failure to obtain Government support in the form of legislative restriction, it is obvious that unanimity of action by a two-thirds majority of all producers is unattainable, even when restriction of output is so clearly the first necessity in any attempt to get the Industry back to a sound position.
>
> In view of the experience of the past 12 months (the history of which has been briefly recorded in the foregoing) the Council of the Rubber Growers' Association are regretfully forced to the conclusion that it is impossible to get sufficient support to establish the proposed Rubber Producers' Corporation, and they have accordingly abandoned the scheme. While the Council are alive to the importance of enlarging the channels for the consumption of rubber and have used and will continue to use their best endeavors to achieve this end, they remain of the opinion that it is disastrous to continue to produce rubber which can only be sold at less than cost of production.
>
> Further, the making of forward contracts to supply rubber, at prices below what must be the cost of production on the great majority of Estates under European management, is against reason, can only help to prolong the present crisis, and defer the date when Rubber Growers can look for any return on the £100,000,000 they have invested in this great industry, on which the prosperity of the people of the protected Malay States so largely depends, and which has, for many years, given occupation and livelihood to hundreds of Europeans and tens of thousands of natives in British Malaya, the Netherlands Indies, Ceylon, South India and Borneo.

W. B. Davis Discusses Business Improvement

W. B. Davis, treasurer of the McLean Tire & Rubber Co., East Liverpool, Ohio, in an interview with a representative of THE RUBBER AGE said that they had enjoyed the best business of 1921 during the month of September. Their plant had been in steady operation throughout the year, but there had been a distinct improvement this fall. They were at present making 350 casings and tubes per day, and had doubled the number of their dealer and distributor accounts over last year.

"I believe next year will be one of the most satisfactory years we will ever have enjoyed in the rubber business," said Mr. Davis. "I would emphasize the word 'satisfactory' to bring out the idea that it may not be the biggest year in total sales as in the war 'boom' years, but I think it will be a solid business of steadily increasing volume. I say this because our business shows a greater number of small orders coming in steadily. Dealers are not over-buying in single large orders but are supplying their needs more frequently. I regard that as an indication of more careful merchandising now that their old stocks are liquidated the dealers are arousing themselves to a display of the real business ability they have always had.

"We have already closed a considerable volume of business for next year, and are putting in considerable new mold equipment to take care of it."

Price Reductions Surprise Industry

The general feeling which had prevailed that there would be no further price reductions in tires this year was dispelled with a crash when both Mason and Oldfield came out with price cuts the last week of October and then followed the Pennsylvania Rubber Co., Firestone Rubber & Tire Company, the Kelly-Springfield Tire Co. and many others.

The Oldfield cut covers Ford sizes only, but the announcement will be received with special interest because all mileage and policy adjustments have been eliminated, which is a movement long looked for in the industry.

The Mason announcement calls for a 15 per cent reduction on all tires. "This unexpected cut," says D. M. Mason, "is in keeping with the demand of the times that profits be shorn to the minimum in order to quote lowest possible prices while still maintaining high quality standards. Our costs have dropped during the past few months owing to abnormally low selling prices of crude rubber, greater plant efficiency, one hundred per cent capacity production and greatest sales in both dollars and units in our history."

The Pennsylvania Rubber Co. of America announced a reduction in the price of tires and tubes, effective November 2, 1921, saying: "Because of intermittent announcements recently made by some manufacturers in connection with changes governing, not as a rule the entire line, but certain sizes, the Pennsylvania Rubber Co. deems it advisable to stabilize its schedule for the season 1921-22 through announcement of a downward revision covering vacuum cup fabric and cord casings, also "ton tested" tubes, effective Nov. 2.

No fixed discount has been employed in reaching the schedule. The revised rates are based on individual costs of vacuum cup tires as manufactured in the plant of the Pennsylvania Rubber Co. In accordance with a definite policy in force with this company since its reorganization, something over a decade ago, the dealer's interests are taken care of and his support assured by maintenance of the liberal differentials heretofore prevailing."

The Kelly-Springfield Tire Company announced a reduction on cord tires amounting to 20 per cent, on fabrics 10 per cent, caterpillar truck tires 15 per cent, standard truck tires 10 per cent, and tubes from 10 to 20 per cent. It was reported that the company soon would announce a special Ford size tire to sell at a popular price.

The Firestone Tire & Rubber Co. announced a 20 per cent reduction in cord tires, 10 per cent in pneumatic fabric tires and 10 per cent in truck tires.

The reduction is the third large reduction in automobile tire prices announced the last twelve months and brings the price of tires to the lowest point in the history of the automotive industry.

Big Business at Goodyear's

That the rubber industry was doing very well and swinging back to normal was indicated by the announcement made by Edward G. Wilmer, president of the Goodyear Tire & Rubber Company that notwithstanding the fact that sales during the first six months of 1920 had exceeded those of any period in the company's history, there had been more tires sold during the ten months up to Oct. 1, 1921, than in the same period a year ago. In September this company sold 69,000 more tires than in September a year ago, he said.

Now the Wedge Heel & Rubber Co.

The Barva Heel and Tire Factory, Inc., of Fort Wayne, Ind., has increased its capital stock from $50,000 to $100,000 all of the increase of preferred stock. The company also had its name changed to the Wedge Heel and Rubber company. The officers of the company are: president, B. R. Barva; vice-president, J. B. Franke, and secretary-treasurer, F. T. Wichman.

Now Bingham-Madison Co.

The Bingham Supply Co. of Mt. Vernon, Washington announces that after Nov. 1 the firm name changes to Bingham-Madison Company. The new member has had experience in the tire and accessory business in Wisconsin and will direct the selling end of the business; Mr. Bingham having charge of buying and accounting.

Williams Purchasing Agent

Mr. O. W. Williams for the last four years in charge of material and costs with the United States Motor Truck Company has just been elevated to the position of Purchasing Agent of that company. Mr. Williams previous experience includes five years as Bank Clerk, and seven years auditor and Service Manager of the Interstate Motor Company. He brings to his new position a fund of valuable information and experience.

Business Better in Canada

The Welland Vale Manufacturing company at St. Catharines, Ontario, Canada is running its plant three days a week. It was closed down this summer for the first time in 40 years. Other plants in the Niagara district are also starting up again. At Merriton, the Independent Rubber plant, which has been closed down, will re-open with full force.

U. S. Motor Leads the Way

At the dedication of the Dixie Highway in Cincinnati a special steel bus body built and furnished by the United States Motor Truck Company lead the procession carrying the Loyal Legion Band. This was quite appropriate because it illustrated the great change that has taken place in transportation, showing in a measure the results coming from the building of these splendid, permanent highways.

The Motor Truck and the Short Haul

Significant as to what part the motor truck may be called on to play in the nation's transportation problem, at least in short haul transportation, is the trip made by the Goodyear six wheel truck between San Francisco and Los Angeles.

The trip of 420 miles was made in 14 hours and 40 minutes, or at an average speed uphill and down of 29 miles per hour. Five tons of freight were carried, mostly tires, tubes and accessories.

The best previous time for the distance was made by a 3½ ton truck which averaged a speed of 24 miles per hour.

The Southern Pacific railroad, over a slightly longer route, makes this same trip by fast passenger train in 14 hours and 50 minutes. The six wheeler's trip was made over the inside or "ridge" road, via Bakersfield and Fresno, rather than the beach road which is comparatively level. The truck had to climb to a height of 1700 feet in the first 27 miles, dropped to 1200 feet in the next seven, then in the next 40 miles had to make an ascent to 4230 feet above sea level.

Fast Motor Truck Service

To get a comparative idea of the significance of this trip, it can be stated that the trip from New York to Pittsburgh, which is approximately the same distance, can be made by a fast passenger train in ten hours and 30 minutes.

From New York to Montreal, which is 430 miles by rail, takes 12 hours by fast passenger train.

The trip from Pittsburgh to Chicago, 468 miles, can be made by fast train in nine hours and 20 minutes.

In other words, freight from New York shipped out of Pittsburgh or Montreal in the morning can be delivered that evening at its destination by motor truck just an hour or so later than the express passenger trains arrive.

Based on an average speed of 29 miles an hour, the Mississippi River can be brought within two days journey by motor truck of either the Atlantic or the Pacific seaboard, providing the progressive improvement of national highways in continued.

The Goodyear truck had recently completed a trip from Akron to Los Angeles making the distance in 7 days 11 hours 35 minutes, actual running time. M. D. Scott, in charge of bus transportation for the Goodyear company at Akron took two drivers with him, who drove in relays sleeping on the bus between shifts.

The six wheeler which is a unique experiment in motor transportation, was designed by Goodyear engineers and has the drive connected with the four rear wheels. It rode on 8 inch tires, giving an economy in first cost and operating expense since four eight inch tires can be bought for less than two 10 inch tires.

Brief Mention

Edward S. Kelly of Springfield, Ohio, retired, one of the founders of the Kelly-Springfield Tire Co., has been elected an alumni member of the board of trustees of the College of Wooster, Wooster, Ohio, class of 1924. Mr. Kelly was graduated from the college with the class of 1878, receiving the degree of master of science.

A. S. Carlton, who served the Union Chemical Company as Vice-President, was elected to the Presidency at a recent meeting of the board of directors of the corporation. Under the direction of Mr. Carlton the Union Chemical Company will maintain its same high grade of service as heretofore.

The Alexander, Holdridge Co. has been organized as distributors of Ajax tires at Lima, Ohio.

Briggs Hinton and John Clements will manage the new branch of the Kokomo Rubber company at Bowling Green, Kentucky.

Bob Clark of the Grauman Studios, Stevens Building, Chicago, well known among the rubber advertising trade through the mid-west spent part of October in Akron and other rubber centers in Ohio.

Calvin Stitt, manager for A. Daigger & Company, 54 West Kinzie St., Chicago, is enjoying a visit from his father and mother who have just returned from a long tour through Japan and China.

J. T. Knight, of Atlanta, has been appointed southern district manager of the Howe Rubber Corporation, with offices at Atlanta, Ga. Until recently he was district manager of the Kelly Springfield company at Atlanta.

A. F. Jones, formerly associated with the Goodrich Tire & Rubber company for six years has opened a large rubber goods establishment under the name of the Jones Rubber store at Fort Wayne, Indiana.

The Middle States Rubber Co. of Cleveland has leased its Painesville plant to a new company to be known as the Painesville Rubber Products Co., which has been incorporated for $60,000.

Fisk Rubber for six months ended June 30 shows net income after depreciation and other charges, but before taxes, of $1,856,268.

Chemical exports of Germany have increased 5 per cent since 1914 despite the handicaps encountered since the nation started its program of world domination, according to Professor George Jahn, in an article published in the European press.

Ray D. McWhorton, a member of the legal department of the Mason Tire & Rubber Co., Kent, Ohio, died October 31 as the result of injuries sustained in an automobile accident. Previous to his affiliation with the Mason company he had been for two years in the treasury department of the Goodyear Tire & Rubber Co., Akron.

Court Actions Pending and Decided

Erie Rubber Co. Sees a Way Out—A Huge Verdict—Court Overrules Stockholders in Portage Case— Trumbull Co. Leased Republic Now Operating

Erie Rubber Co. Sees a Way Out

Receiver H. C. Greenlee, in a report filed by the creditors committee of the Erie Tire & Rubber Co. in the federal court at Toledo, Ohio, asked that he be authorized to collect unpaid subscriptions for Erie Tire & Rubber Co. preferred stock, which it is claimed amount to $278,404 and to obtain payment for outstanding common stock amounting to $1,029,986, much of which was issued as bonuses to purchasers of preferred stock.

This committee, which was appointed by the court sometime ago, consists of Fred B. Peterson, David Kubie, Hendricks H. Whitman and F. P. Zollinger and was authorized to administer, collect and distribute assets. Its report shows claims amounting to more than $500,000 have been filed and that the company's assets and book values amount to $759,764.34.

In recommending that preferred stock subscriptions be collected and that the value of outstanding common stock be obtained from the holders, the committee asserts in its report that unless the receiver is able to make these collections it will be necessary to sell the propery. There is only $100,000 in the hands of the receiver with which to meet claims amounting to more than $500,000, the report says.

Operating under Receivership

Federal Judge D. C. Westenhaver has issued an order permitting the operation of the Canton plant of the Republic Tire and Rubber company under receivership, until the further order of the court. The Youngstown plant also is included in the court's order.

The court's order provides that the receiver shall not make contract for fabrics and other materials more than six months ahead.

The company has been in the hands of a receiver since last June. In normal times the plants produce 4,000 tires daily.

Receiver Asked For Zenith Co.

Application for a receivership for the Zenith Tire and Rubber Co., of Toledo, has been made to the court by Harry S. Barfield and Alvin C. Hughes. Hughes says the authorized capital was $10,000,000 and that $2,700,000 worth of stock was subscribed for, a large part of which has not been paid.

The Zenith's assets, according to Hughes, consist of 236 acres of land near Willoughby, O., which was to cost $469,000, but on which only $200,000 has been paid. In addition to this the Zenith owns a controlling interest amounting to $500,000 in the Mid-Continental Tire Manufacturing Co., Wichita, Kan.

Big Verdict Against Columbia

A jury in a breach of contract action brought by George W. Stephens of Mansfield, Ohio, against the Columbia Tire & Rubber Co., of Columbiana, Ohio, after a trial extending over three weeks returned a verdict late in October for $417,477.54 in favor of Stephens in the Mahoning County Court at Youngstown, Ohio. Attorney Fred Heim had charge of the trial for Mr. Stephens and was assisted by Judge U. C. Deford of Youngstown and Major Charles Houston and Attorney Jesse E. LaDow, secretary of the Mansfield Tire & Rubber Co., Mansfield, Ohio.

The jury found that Stephens entered into a contract with the defendant company on May 1, 1918, as general sales manager for which he was to receive as compensation 5 per cent commission on the net sales of tires and tubes, billed and shipped by the company less seconds and by-products. He was also general sales manager of the Mansfield Tire & Rubber Co., Mansfield, Ohio, and of the New Jersey Car Spring & Rubber Co., Jersey City, N. J., all of which companies were at that time under one management.

Shortly after that time the Henne Brothers, G. W. and W. G. Henne, withdrew from the Mansfield Car Spring-Columbia combination and took over the Columbia plant at Columbiana. They have since built another plant at Mansfield where the main office of the Columbia Tire & Rubber Co. is now located.

The jury found that the contract continued in force until November 13, 1919, at which time it was breached and that Stephens was entitled to receive commission on sales of $7,768,550.80 which amounted to $388,427.79. They also awarded Stephens by special verdict $29,050 additional which he was entitled to receive on account of bonuses and increased salaries paid to district sales managers and salesmen.

May Reorganize Kelley Co.

The stockholders protective committee of the Kelley Tire and Rubber Co. submitted to Judge John E. Keeler in the civil side of the superior court in New Haven a statement to the effect that it is considered advisable that some expert make a survey of the plant with reference to the possibility of re-organizing the concern.

It was stated that George W. Goethals & Co. of New York were willing to make such a survey at a cost of not to exceed $1,000, this to include whatever recommendations should be made. The judge approved the plan, which is to be carried through by the receivers.

Refuses to Interfere In Portage Sale

Federal Judge D. C. Westenhaver has refused to interfere in the proposed sale of the bankrupt Portage Rubber Co.'s assets to F. A. Seiberling, former head of the Goodyear Co.

He overruled motions made in a petition of W. A. Jones, a stockholder and creditor of the Portage company, which sought to stop the private sale of the property.

Judge Westenhaver, however, pointed out that the stockholders would have ample opportunity to present their objections at a hearing which is yet to be held before Referee Snyder of Akron, when the trustee applies for confirmation of the sale.

All questions brought up should more properly arise upon the trustee's application to confirm the sale, Judge Westenhaver held, and any objection may be made then. Those questions are not now before the court, he declared. The order of sale was made subject to the right of anyone prior to confirmation by the referee to present a better bid and the authority to sell is not absolute until the report of the sale is presented and confirmed.

The trustee was instructed to hear any objections at that time and to certify these and any other bids to the court for final review if objecting stockholders desired.

The hearing before Harry L. Snyder, referee in bankruptcy on November 5 at Akron was the occasion of heated arguments from the group of attorneys representing stockholders who have opposed the sale to the Seiberling interests.

George D. Bates, trustee of the company, was forced to deny on the witness stand that there was any collusion between banker and creditors and Seiberling to force the concern into bankruptcy, by the insistent questioning of these attorneys. He also declared that Seiberling's offer had been accepted by him because it was approved by the largest block of creditors of the Portage Rubber Co., the fabric dealers, as well as by other creditors.

The offer of B. O. Etling, Barberton lumber dealer and stockholder, who with E. A. Tinsman, formerly with the Standard Tire Co. of Willoughby, Ohio, was discussed in court. Bates was asked why he had approved Seiberling's offer in preference to Etling's. He declared in answer that he thought the Seiberling offer had better financial backing.

Hubbell Tire Secures Lease

A lease has been executed between J. P. Hyland of Youngstown, receiver of the Trumbull Tire and Rubber Co. of Newton Falls and the Hubbell Tire and Rubber Co., of Cleveland, whereby the latter takes over the former's plant at Newton Falls, for a one year period, at a rental of $12,000. The lease dates from November 1, 1921.

Fisk Rubber Co. Elects Officers

With the centering of the executive departments of the Fisk, Federal and Ninigret Companies, under the recent adjustments in New York, the treasury department becomes a part of the New York organization and will hereafter be located there. H. G. Fisk who has served as treasurer will not, on account of interests located in Springfield be transferred to New York. He has resigned as treasurer to become Vice President of the Company and will continue to make his headquarters at Chicopee Falls. Robert B. McGaw, for a number of years the assistant treasurer, has been elected treasurer and will have his office in New York City. J. W. Rowland has been elected assistant treasurer.

The officers and directors are: President, H. T. Dunn, New York; Vice President, H. G. Fisk, Springfield; Vice Pres. and Gen'l Mgr. Fisk Division, E. H. Broadwell, Longmeadow, Mass.; Vice Pres. and Fact'y Mgr. Fisk Division, J. D. Anderson, Springfield; Vice Pres. and Gen'l Mgr. Federal Division, B. H. Pratt, Milwaukee; Vice Pres. in charge of Rubber and Fabric Purchases, G. A. Ludington, New York; Treasurer, R. B. Mc Gaw, New York; Asst. Treasurer, J. W. Rowland, New York; Comptroller, E. M. Bogardus, New York; Secretary, A. A. Leiser, Jr., New York. Directors: Ralph H. Bollard, New York; Edward H. Broadwell, Longmeadow, Mass.; Stedman Buttrick, Boston; William F. Cutler, New York; James Dean, Boston, Mass.; Harry T. Dunn, New York; Harry G. Fisk, Springfield; Benjamin H. Pratt, Milwaukee; Richard S. Russell, Boston.

Pending the completion of the Fisk Building at 57th St., Broadway and 8th Avenue on or about December 1st, the New York offices will remain at 52 Vanderbilt Avenue.

McGraw Tire Shows Progress

Readjustment of the financial affairs of the McGraw Tire & Rubber Company was brought to a successful completion October 1 by the formal adoption of a plan which assures the future success of the company. No new financing is contemplated, the company having ample working capital for its present needs.

Under this plan, a reorganized Board of Directors which includes representatives of banking interests and merchandise creditors will cooperate with the management in the conduct of the business. The plan does not call for any change in the present personnel of the company.

In an announcement, President John Morgan states—the company has been successful in effecting very satisfactory settlement on all merchandise contracts. Reduction of indebtedness to banks and merchandise creditors aggregating $400,000.00 has been effected since the plan became operative. In addition all current purchases are discounted and ample cash is in the treasury to provide working capital.

Tenth Annual Congress National Safety Council

The following resolutions were adopted at the Tenth Annual Congress of the National Safety Council which was held at the Massachusetts State House in Boston recently:

Whereas the 80,000 accidental deaths and millions of injuries occurring each year on the streets, in our industries, in homes, and elsewhere more than twice the number of all American casualties in the great war are a blot on our civilization and

Whereas national experience has demonstrated that 75 per cent of industrial accidents are preventable; experimental campaigns in seven cities having resulted in the reduction of public accidents by 25 to 40 per cent and further efforts will undoubtedly result in even greater progress, and

Whereas the direct economic cost of accidents in industry alone exceeds one billion dollars annually, and greater indirect losses are caused by the curtailment of production and lowering of morale, Therefore be it resolved that the National Safety Council at its Tenth Annual Congress in Boston assembled advocates:

1. The safeguarding of all dangerous machinery and places according to methods that have been found practical and effective.
2. The re-designing and reconstruction of Factory Equipment when necessary and the improvement of dangerous processes for the purpose of removing the accident hazards, and at the same time increasing industrial efficiency and lowering cost:
3. The Education of all workmen and their supervisors in safe methods and habits of work:
4. The Safety Education of all School Children, as well as students of our Colleges and Universities, both for their own safety and to stimulate interest in the conservation of life and a better citizenry, and
5. The mobilization of all community forces, including City and State at Safety Councils for intensive and permanent campaigns against accidents of all types.

At a meeting of the Executive Committee of the National Safety Council following the Congress B. F. Tillson of the New Jersey Zinc Co., Franklin, N. J., was elected vice-president for industrial safety. At this meeting was approved the organization of a Drop Forge Section and a Petroleum Section by the companies in its membership interested in more intensive accident prevention activities in those two groups of industries.

Big Toledo Combination

The Towar Consolidated Mills of Toledo, a large holding corporation has secured control of the Andes Tire and Rubber Co. The Towar company also controls the Towar Textile Mills and Towar Cotton Mills and the Acme Belting Co., of Niles, Michigan. This gives Toledo one of the most complete automobile plants in the country. S. S. Towar, president of the merged companies announces that the new plant will have a capacity of 500 tires a day. The plant will be in operation February 1 and only cord tires will be made.

Madison Tire Sales Conference

All sales representatives, factory, sales and administrative executives, as well as heads of departments of the Madison Tire & Rubber Co., Inc., met in conference at the Iroquois Hotel, Buffalo, N. Y., October 15, 16 and 17.

Improved methods of tire and tube construction at the factory were shown all the Madison men by the Tire Superintendent, R. D. Belden. Bead construction and tube coloring are two of the more recent improvements made by the Madison Tire organization.

A discussion on the future of Madison business in relation to other tire manufacturers in the field was lead by Joe M. Dine, Sales Manager. The Credit Manager, R. E. Haley made an address on modern credits and collections.

August Loos, Manager of the Service and Traffic Department, and A. C. Morgan, Manager of the Order Department, explained the functioning of their respective departments. H. Tyler Kay, Advertising Manager, spoke of the advertising policy for 1922.

After the banquet, R. A. Low, President, spoke of the business outlook and in retrospect pointed wtih much pride to a number of men in the audience who had been with him in the rubber business for over twenty years. Mr. Low has now been in the rubber business forty-one years.

Free Tire Advice for Truck Owners

With a view to enabling truck owners to secure greater efficiency from their trucks and to lessen their tire bills, a Technical Service Bureau was established a few months ago by the United States Tire Company to solve any tire problems submitted by truck owners.

In announcing the establishment of the bureau, the company expressed the fear that nearly half the trucks of the country were operating on tires not best suited to them. The avidity with which truck owners in all parts of the country have availed themselves of the offer of this free tire advice has demonstrated that nearly every owner has some special problem which only a skilled engineer is qualified to pass on. Any truck owner anywhere may address the Technical Service Bureau, United States Tire Company.

Regular Goodrich Dividend

The directors of the B. F. Goodrich Co. at the quarterly meeting held in Akron today declared the regular dividends of $1.75 per share, payable upon the preferred stock of the company January 2, 1922, to stockholders of record December 22, 1921.

Fisk Rubber Nets $1,856,268

For the six months ended June 30 the Fisk Rubber Company reported a net income, after depreciation and other charges, but before taxes, of $1,856,268. Net sales amounted to $18,122,145 and gross profit, after depreciation, $6,156,255.

Mileage Guarantees on Tires Abolished

Probably the most important recent achievement of the Rubber Association of America was embodied in the announcement by General Manager Viles on November 14 that tire manufacturers had finally decided to abolish mileage guarantees on tires and hereafter would only guarantee freedom from defects in materials and workmanship.

This decision was definitely arrived at on October 27, when the commendation of the executive committee of the tire manufacturers division of the association to this effect were adopted. A manufacturer's standard form of warrantee and a standard claim form based on the above stated policies were adopted at the same time.

This important action has been under discussion by these tire manufacturers for several years. But the movement for abolishing mileage guarantees did not take definite form until the tire manufacturers division of the association was organized in January 1919.

Tinsman President of New Rubber Company

Ed. A. Tinsman recently connected with the Standard Tire Co., Willoughby, Ohio, on November 3 was elected president of the recently organized Salem Rubber Co., of Salem, Ohio, which will take over the plant of the defunct Porter Rubber Co., at Salem, which was recently sold to L. W. Hicks of Pittsburgh, Pa.

The new company has a capital stock of $250,000 and will manufacture both cord and fabric tires and expects to begin with a production of 250 tires per day.

Mr. Tinsman was formerly superintendent of the Portage Rubber Co.'s plant at Barberton, and was one of the interests trying to secure control of that plant since the failure last June. When it became evident that the Portage plant was going to be acquired by F. A. Seiberling, Mr. Tinsman and his associates turned their attention to the Porter plant at Salem which had failed and had been shut down for some time.

Mr. Tinsman has had long experience in tire manufacturing and is regarded as one of the most capable men in the trade. The former Porter Rubber Co was started about 1917 and had a well equipped plant which the Salem Rubber Co. now takes over.

Nottingham Rubber Co. Organized

(Special Trenton Correspondence)

The Nottingham Rubber Co. has been incorporated under New Jersey laws with a capital stock of $500,000, and plans to erect a plant near Philadelphia for the manufacture of tires and tubes. Samuel H. Bell of Reading, Pa., is president of the company, C. Francis Fisk of Trenton, N. J., vice president, and I. Alexander of Trenton, secretary.

Mr. Fisk is the holder of patent rights on the manufacture of an inner tube said to be puncture-proof, which can be marketed at a moderate price.

Canadian rights on his invention have been acquired by the Premier Tire Company of Toronto, which is declared to be turning out the patented tubes at the rate of 400 a day.

C. S. Dickey Made Treasurer

The Board of Directors of the Grand Rapids Tire & Rubber Corporation, Grand Rapids, Mich., have recently announced the appointment of C. S. Dickey as treasurer of the organization. Mr.

C. S. Dickey

Dickey comes to the company from the Western Tablet & Stationery Co. of St. Joseph, Mo., where he was vice-president. Prior to his connection there he was for fifteen years credit manager of the Wyeth Hardware & Manufacturing Co. also of St. Joseph.

Avalon Reports Satisfactory Business

The Avalon Rubber Mfg. Co., with main offices in the People's Savings and Trust Bldg., Akron, and factories at Barberton and Sterling, Ohio, manufacturers of rubber heels and a general line of mechanical pressed and tubed goods, report satisfactory business. Officers of the company state that although business is slightly below normal, orders continue to come in satisfactory volume, and there is no indication of a let-down in the near future.

Concentrate on Rubber Gloves

Due to the large increase in orders for surgical and household rubber gloves the Lincoln Rubber Co. of Barberton, Ohio has discontinued manufacturing balloons.

Strike at Ajax Trenton Plant

(Special Trenton Correspondence)

Closing of the Ajax Rubber Co's Trenton plant for an indefinite period has been decided on, according to a statement made by Superintendent William W. MacMahon on November 7. It appears that between 40 and 50 tiremakers went on strike refusing to accept a 10 per cent cut in wages. Many in other departments went on strike in sympathy with them. This was followed by a movement for the organization of a tiremakers' union.

It is reported that the company will transfer a large portion of the orders that were being filled at their Trenton plant to the Racine, Wis., plant.

The closing down of the Trenton plant would mean that about 1,000 employees there would be idle.

General Tire & Rubber Celebrates

William O'Neil, vice president and general manager of the General Tire & Rubber Co., Akron, Ohio, announced on October 26 that a year ago the company owed $2,500,000, or $500,000 more than the company's issued capital and surplus combined.

On October 26 the entire indebtedness was paid off, the event was celebrated by blowing the whistles and fire sirens on the factory.

States Metals Co. to Market their Products Direct

The States Metals Co., 30 Church Street, New York, will in the future market their products direct instead of through Frazar & Co., who have been their sales agents since 1915. They manufacture the States brand of sulphuret of antimony, the Thistle brand of magnesia and the XLO accelerator, a magnestated diphenylguanidine, all of which are extensively used by rubber manufacturers. This company also manufacture dynamine which is the chemically pure diphenylguanidine.

Their new accelerator plant at Newark is now in operation

Messrs. Martin, Hoyt & Milne, Merchants' Exchange Building, San Francisco, California, with branch offices in Los Angeles, Portland, Seattle and Vancouver, have been appointed their sales agents on the Pacific Coast. Stocks of their products will be carried on the Pacific Coast.

J. A. Kendall will continue as their Akron representative with headquarters in the First-Second National Building, Akron.

Theodore E. Smith President of Akron Red Cross

Theodore E. Smith, president of the Standard Savings Bank of Akron, and also of the Better Akron Federation, was elected chairman of the Summit County Chapter of the American Red Cross at the annual meeting October 24. His many friends in the rubber trade will congratulate him on this honor.

MARKETS

Cottons, Yarns and Fabrics

NEW YORK, NOVEMBER 7, 1921

The cotton market during the period under review showed continued nervousness and irregularity. Bullish sentiments as to ultimate values seem to predominate. The increasing American consumption and the large exports, combined with the small crop, have reduced the supply of cotton in this country to a point well below corresponding dates for several years past.

Consumption of cotton by American mills reached a new high point for the current year during September, totalling 484,647 bales. In the 1916-1917 cotton season, a period of maximum production on heavy war goods, the mills consumed at the rate of 565,000 bales per month. In the 1919-1920 season, the height of the post-war prosperity, they used an average of 535,000 bales a month. These figures indicate that the industry ran in September at about 90 per cent of capacity.

Exports of cotton have been very heavy during the month. In the four weeks ending October 21, they totaled 754,000 bales against 453,000 in the same period last year and 289,000 two years ago. From August 1 to October 21 they aggregated 1,478,000 this year, compared with 803,000 last year and 983,000 two years ago. In the pre-war years 1912 and 1913, however, the exports in the four weeks ending about the 21 of October aggregated nearly 1,200,000 bales, and in the period from August 1 to the third week in October nearly 1,800,000 bales.

The following are the closing, highest and lowest prices as of Nov. 7:

	Closing	High	Low
Nov.	*18.30a	....	....
Dec.	18.45a18.49	18.50	18.23
Jan.	18.24a18.29	18.30	18.05
Feb.	*18.20a	18.09	18.09
March	18.13a	18.18	17.98
April	*17.97a	....	....
May	17.80a17.87	17.91	17.75
June	*17.60a	....	....
July	17.34a17.36	17.45	17.28
Aug.	*17.05a	....	....
Sept.	*16.75a	....	....
Oct.	*16.45a	16.50	16.38
Market—	Barely steady.		
Trans.—	18.30		

*Nominal.

SHEETINGS—DUCKS—BURLAPS

An important factor commenting on the condition of the fabric market says that there is little likelihood of a decline in fabric prices.

He asserts that most of the mills are selling cloths at cost and in many instances below cost. It is his opinion that the liquidation of labor in the woolen mills has run its course for the time being and he points to the strong possibility of higher prices.

SHEETINGS—More competition was shown in securing business and some mills are ready to make concessions on contracts on sheetings for delivery after the first of the year.

DUCKS—Market without any particular feature. At the convention of the National Association of Cotton Manufacturers that opened in Boston this week the question of the standardization of cotton ducks that has occupied the attention of the government and the Duck Manufacturers' Association, will be considered.

BURLAPS—Prices have been somewhat irregular, spot and nearby goods, especially light weights are in fairly good demand. Calcutta prices have been coming lower daily for some time, persumably on account of lack of business and the heavy speculation that is going on. It looks as though prices have reached a point where purchases can be made to advantage; the reaction has evidently run its course and value should turn upward.

COTTON STATISTICS

	Nov. 5	Last wk.	Last yr.
Port receipts	26,576	41,146	25,016
Exports	7,623	41,293	474
Exports, season	1,769,972	1,607,090	1,150,608
New York stocks	122,362	133,687	22,526
Port stocks	1,568,522	1,552,752	1,164,331
N. Y. arrivals	4,189	.....	3,650

Liverpool cables: Spot cotton quiet, 26 points decline at 12.11 for middling. Sales 5,000 bales, of which American 4,000; imports 13,000; American 9,000. Futures quiet, 15 to 18 points decline.

ALEXANDRIA

Statistics for the week ending Oct. 7, 1921

	ARRIVALS Cantars	EXPORTS (Bales) England	Con'nt	America	TOTAL EXPORTS Cantars	STOCK Cantars
This week	165,030	12,431	6,353	5,001	181,023	1,690,188
Same week 1920	135,841	4,058	2,456	550	54,307	618,530
" " 1919	234,494	4,796	764	30	43,183	734,951
Since Sept. 1, 1921	547,957	39,491	30,026	21,462	692,769	——
Same time 1920	358,976	10,784	6,608	750	138,648	——
" " 1919	722,085	40,565	5,950	10,816	430,134	——

EGYPTIAN COTTON

The government puts the crop at 3,300,000 cantars which is the smallest crop in over 30 years. The first year of the World War, owing to reduced acreage the crop was 4,806,331 cantars. However it should be remembered that the stock in Alexandria on September 1, 1921 was about 2,000,000 cantars against 500,000 the year previous.

It is further estimated that at least 1,000,000 cantars of the 1921 crop was never shipped to the Alexandria market owing to the poor demand.

This would make the available supply of Egyptian cotton in Egypt for the season of 1921-22 6,000,000 cantars, about a normal supply.

TIRE FABRICS (Square Woven)

17¼-ounce Egyptian uppers, combed,	lb.	.87 @	.90
17¼-ounce Egyptian uppers, carded,	lb.	.82 @	.85
17¼-ounce Sakellarides, combed	lb.	.94 @	1.00
17¼-ounce Sakellarides, carded,	lb.	.87 @	.90
17½-ounce Peelers, combed,	lb.	.75 @	.80
17½-ounce Peelers, carded,	lb.	.56 @	.62

CORD FABRICS

Combed Sakellarides	lb.	.99 @	1.05
Carded Sakellarides	lb.	.92 @	.95
Combed Peeler	lb.	.90 @	.95
Carded Peeler	lb.	.65 @	.67
Combed Egyptian uppers	lb.	.92 @	.95
Carded Egyptian uppers	lb.	.87 @	.90

DUCKS

Belting (pound basis)	lb.	.39 @	—
Hose (pound basis)	lb.	.39 @	—
*Enameling	lb.	.39 @	.46
Shoe Ducks	lb.	.40 @	—
Single filling	yd.	.16 @	.20
Double filling	yd.	.19½ @	.21

DRILLS

37-inch	3.25-yard	yd.	.11½ @	—
37-inch	2.75-yard	yd.	.12¾ @	—
37-inch	3.00-yard	yd.	.12 @	—
37-inch	3.50-yard	yd.	.11¼ @	—
37-inch	3.95-yard	yd.	.10½ @	—

OSNABURGS

30-inch	7-ounce		.09½ @	—
40-inch	7-ounce		.11½ @	—

SHEETINGS

40-inch	2.50-yard	yd.	.14¼ @	—
40-inch	2.85-yard	yd.	.12½ @	—
40-inch	3.15-yard	yd.	.14 @	—
40-inch	3.60-yard	yd.	.12¼ @	—
40-inch	3.75-yard	yd.	.11 @	—
40-inch	4.25-yard	yd.	.10 @	—

BURLAPS
(Carload Lots)

7 -ounce	40-inch	yd.	3.80 @	—
7½-ounce	40-inch		3.95 @	—
7½-ounce	45-inch		4.55 @	—
10 -ounce	40-inch		5.00 @	—
10 -ounce	36-inch		4.85 @	—
8 -ounce	40-inch		4.05 @	—
10 -ounce	45-inch		6.15 @	—
10½-ounce	40-inch		5.10 @	—

Chemicals and Compounding Materials

THE GENERAL MARKET—NOVEMBER 5, 1921—The Industrial Chemical market was more active during the last week of October than at any time since the revival in business started. This was due in a measure to the threatened railroad tie up but some factors state that buying for other reasons was very much in evidence and look for continued increasing business. While prices are still in many instances below the cost of production increased business would speedily rectify this. Manufacturers are now less fearful of the effect of foreign chemicals in this market than they have been in the past.

ACCELERATORS

Organic

Aldehyde ammonia, crystals	lb.	$ .95 @	1.00
Aniline oil, bulk basis,	lb.	.18 @	.26
Excellerex,	lb.	.55 @	.65
Formaldehyde-aniline	lb.	.50 @	.55
Hexamethylene-tetramine (powdered)	lb.	.75 @	.80
Paraphenylene-diamine	lb.	1.70 @	1.75
Thiocarbanilid	lb.	.35 @	.40
Vulcocene	lb.	.. @	..

Inorganic

Lead, dry red, bbls.	lb.	.10 @	—
Lead, sublimed white	lb.	.07 @	—
white, basic carbonate	lb.	.06½ @	.07¼
Litharge, commercial, bbls.	lb.	.08 @	.08½
Lime, hydrated	lb.	.03 @	—
Magnesia, calcined, extra light	lb.	.50 @	.55
heavy	lb.	.06 @	.07
Magnesite, powdered	ton	50.00 @	65.00

COLORS

Blacks

Bone, powdered	lb.	.06½ @	.08½
Carbon black	lb.	.10½ @	.20
Drop	lb.	.07½ @	.16
Ivory	lb.	.15 @	.45
Lampblack	lb.	.17 @	.45

Blues

Prussian	lb.	.50 @	.60
Ultramarine	lb.	.15 @	.35
Cobalt	lb.	.27 @	.35
Rubber maker's blue	lb.	3.50 @	—

Browns

Iron oxide	lb.	.04½ @	.05½
Sienna, Italian, raw and burnt	lb.	.06 @	.07
Umber, Turkey, raw and burnt	lb.	.05½ @	.06½

Greens

Chrome, light, c. p.	lb.	.30 @	.32
medium	lb.	.35 @	.36
dark	lb.	.36 @	.45
oxide	lb.	.50 @	.60

Reds

Antimony, crimson	lb.	.40 @	.45
golden	lb.	.21 @	.25
red	lb.	.23 @	—
Indian, pure	lb.	.08 @	.14
Oxide, copperas, pure	lb.	.14 @	—
reduced	lb.	.11½ @	.12½
Para toner	100 lb.	1.40 @	—
Toluidine tone	lb.	2.50 @	2.75
Tuscan	lb.	.17½ @	.30
Venetian	lb.	.02½ @	.05
Vermillion, English, quicksilver	lb.	.80 @	.85
domestic	lb.	.25 @	.30

Whites

Albalith	lb.	.06 @	.06¼
Aluminum bronze	lb.	.60 @	.65
Lithopone, Beckton white	lb.	.06 @	.06½
Lithopone, domestic (factory)	lb.	.06 @	.06½
Zinc oxide, American Horse Head Special	lb.	.08 @	.08½
XX red	lb.	.07½ @	.08
Zinc oxide, French process, White seal	lb.	.11 @	.11½
Green seal	lb.	.09¾ @	.10¼
Red seal	lb.	.08¾ @	.09¼

Yellows

Cadmium sulphide	lb.	1.25 @	1.50
Chrome, light, c. p.	lb.	.18 @	—
dark	lb.	.18 @	—
medium	lb.	.18 @	—
Ocher, French	lb.	.02½ @	.03½
domestic	lb.	.02 @	.03
Zinc chromate	lb.	.33½ @	—

COMPOUNDING INGREDIENTS

Aluminum flake	ton	.29½ @	—
hydrate	ton	22.00 @	25.00
Ammonium carbonate, powdered	lb.	.06 @	.09
Barium dust	ton	100.00 @	—
Barytes, Southern off-color,	ton	20.00 @	—
Western, prime white,	ton	23.00 @	—
Basofor	lb.	.04 @	—
Beta-naphtol, technical	lb.	.33 @	—
Blanc fixe, dry, f.o.b.works	lb.	.03½ @	—
Chalk, precipitated, extra light	lb.	.03½ @	.04½
heavy	lb.	.02½ @	.03¼
Clay, China, domestic,	ton	7.50 @	9.00
imported	ton	16.00 @	24.00
Dixie	ton	22.00 @	35.00
Blue Ridge	ton	22.00 @	32.00
Fuller's Earth, powdered	ton	22.00 @	25.00
Fossil flour	ton	60.00 @	..
Glues, extra white	lb.	.30 @	.40
medium white	lb.	.22 @	.28
cabinet	lb.	.18 @	.32
cabinet low grade	lb.	.15 @	.18
common bone	lb.	.09 @	.14
Graphite flake, bbls.	lb.	.10 @	—
powdered	lb.	.05 @	—
Ground glass, fine	lb.	.03½ @	.04
Infusorial earth, powdered	ton	60.00 @	—
bolted	ton	65.00 @	—
Liquid rubber	lb.	.15 @	—
Rotten Stone	lb.	.02½ @	.04½
Silica (aluminum)	ton	23.00 @	25.00
Soapstone, powdered	ton	12.00 @	—
Starch, powdered corn	cwt.	1.85 @	2.10
Talc, domestic	ton	18.00 @	20.00
French	ton	22.50 @	30.00
French, high grade	ton	40.00 @	45.00
Italian	ton	40.00 @	45.00
Terra Alba, American No. 1	cwt.	1.85 @	2.00
American No. 2	cwt.	1.25 @	..
Tripoli	ton	— @	—
Whiting, commercial	cwt.	1.05 @	1.10
Quaker	ton	13.00 @	15.00
English cliffstone	cwt.	1.60 @	2.00
glider's bolted	cwt.	1.20 @	1.35
Paris whiteAmerican	cwt.	1.30 @	1.40
Zinc Oxide— 5 per cent leaded		.07¼ @	.07¾
10 per cent lead sulphate	lb.	.07 @	.07½
20 per cent lead sulphate	lb.	.07 @	.07½
35 per cent lead sulphate	lb.	.07 @	.07½

MINERAL RUBBER

Gilsonite	ton	70.00 @	—
Genasco (c. l. factory)	ton	50.00 @	—
(l. c. l. factory)	ton	52.00 @	—
Hard hydrocarbon	ton	33.00 @	45.00
Soft hydrocarbon	ton	30.00 @	40.00
M. R. X.	ton	— @	—
Pioneer (c. l. factory)	ton	34.00 @	65.00
Raven M. R.	ton	— @	—
320 M. P. hydrocarbon (c. l. factory)	ton	50.00 @	55.00
(l. c. l. factory)	ton	57.50 @	—
300/310 M. P. hydrocarbon (c. l. factory)	ton	40.00 @	—
(l. c. l. factory	ton	45.00 @	—
Synpro, granulated, M. R. (factory	ton	59.50 @	64.00

SOFTENERS

Acids

Acetic, 28 per cent	lb.	.02¼ @	.03
Carbolic (phenol)	lb.	.09½ @	.16
Cresylic, 97 to 99 p. c. pale	gal.	.70 @	.75
Muriatic, 20 degrees	cwt.	1.40 @	2.00
Nitric, 36 degrees	cwt.	5.50 @	6.50
Sulphuric, 66 degrees	ton	17.00 @	18.00
60 degrees, bulk	ton	11.00 @	12.00
Tartaric, crystals	lb.	.35 @	—

Alkalies

Caustic soda, 76 p.c.	lb.	.04 @	.05
soda ash, 58 p. c.	cwt.	2.10 @	2.15

Oils

Castor, No. 3, bbls.	lb.	.12 @	—
Corn, crude, bbls.	lb.	.09 @	.09½
refined	lb.	.11½ @	—
Chinawood, bbls.	lb.	.13½ @	.13¾
Cottonseed,	lb.	.10¼ @	—
Glycerine, c. p. drums	lb.	.14½ @	.15
Linseed, carload spot	gal.	.70 @	—
bbls.	gal.	.72 @	—
Palm, Niger	lb.	.06½ @	—
Lagos	lb.	.07½ @	.07¾
Peanut,domestic crude	lb.	.11 @	—
Pine, steam distilled over 930° sp. gr.	gal.	.97 @	—
Rapeseed, refined	gal.	.86 @	.90
blown	gal.	.95 @	—
Rosin, first rectified	gal.	.40 @	—
second, rectified	gal.	— @	—
Tar, commercial	gal.	.29 @	.30
Soya Bean,crude,bbls.	lb.	.09 @	—

Resins and Pitches

Cantella gum	lb.	.50 @	..
Cumar resin	lb.	.09 @	.13
Tar, retort	bbl.	9.50 @	12.00
kiln burned	bbl.	9.50 @	12.00
Pitch, Burgundy	lb.	.05 @	.06
coal tar	ton	20.00 @	—
rosin	bbl.	5.85 @	—
Rosin, grade B, ex-yard	bbl.	5.55 @	—
grade K	bbl.	6.45 @	—
Shellac, fine orange	lb.	.75 @	.80

Solvents

Acetone, drums, c.p.	lb.	.12½ @	.13
Alcohol, denatured, No. 1	gal.	.40 @	.41
Methyl, 95 per cent, drums	gal.	.60 @	.63
Ethyl, 190 proof, bbls.	gal.	4.70 @	4.80
Benzol, 90 per cent	lb.	.25 @	.30
pure	lb.	.27 @	.40
Carbon bisulphide,	lb.	.07 @	.07¼
tetrachloride	lb.	.11 @	.13
Dimethylaniline	lb.	.40 @	.45
Naptha, motor gasoline, steel bbls.	gal.	.25 @	—
Talool, pure drams	gal.	.28 @	—
Turpentine, spirits	gal.	.76 @	—
wood	gal.	.74 @	—
Xylol, pure	gal.	.40 @	.43
commercial	gal.	.28 @	.35

Waxes

Beeswax white, pure	lb.	.55 @	—
Caranuba, No. 1	lb.	.16 @	—
Ceresin, white	lb.	.12 @	—
Bayberry	lb.	.19½ @	.20
Montan, crude	lb.	.07 @	—
Ozokerite, hard, pure,	lb.	.25 @	—
Paraffin	lb.	.02 @	—
Petrolatum, amber, bbls.	lb.	.05 @	.05½
dark amber,	lb.	.04½ @	—

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.09 @	.16
Brown	lb.	.11 @	.15
Brown factice	lb.	.07 @	.14
White factice	lb.	.08½ @	.15½
Paragol, soft and medium	cwt.	6.81 @	—
hard	cwt.	6.81 @	—

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.40 @	—
Orange mineral, domestic	lb.	.11 @	.13
Sulphur chloride (jugs)	lb.	.20 @	—
Sulphur flour Brooklyn brand (c.l.)	cwt.	— @	—
Brooklyn brand (l. c. l.)	cwt.	— @	—
Bergenport (c.l.)	cwt.	2.55 @	—
pure soft	cwt.	2.30 @	—
superfine (c. l.	cwt.	2.40 @	2.90

Litharge—Consumers continue to buy only what they must have for immediate consumption. Business has been better but by no means normal.

Lithopone—There are still considerable quantities of foreign product coming in to the market; particularly from Belgium. The market is taking it all and domestic manufacturers report that the home product is moving well. It does not look as though consumers will carry over more than normal stocks at the end of the year.

Blanc Fixe—The market remains inactive with prices unchanged. Dry quoted at 3½ to 3¾ cents per pound.

Colors—Consumers are showing more interest in the market. Prices are still maintained at a low level in most items. English vermillion advanced five cents which is about the only important change.

Zinc Oxide—The demand from the tire manufacturers is the one strong feature in this market. Some foreign material but not in any substantial quantities is coming in. There has not been enough to interfere with the demand for the domestic article.

Linseed Oil—Demand has improved and a firm tone has characterized the market during the last period. Important factors in the trade look for a further expansion in the demand as general business continues to improve.

Caustic Soda—There has been a falling off in demand which has resulted in an easier market.

Soda Ash—A slightly easier tone was noticed with trading a little more active. Light ash in bags on spot ranged from $2.10 to $2.15 per 100 pounds.

Aniline Oil—There has been a decidedly firmer tone and some makers refused to quote below 20 cents. Price in general, however, ruled around 19 cents. Business was in moderate quantities only. Some in the trade speak hopefully of higher prices next month.

Orange Mineral—Little change is noted in the character of the market whatever improvement there is being for the domestic brands rather than the imported.

Talc—There is a good demand for both domestic and imported talc. Domestic material is offered at $18 to $20 per ton; French at $22.50 to $30.00.

Carbon Tetrachloride—The asking prices of the different makes remain the same. The market was slow and presented no particular feature.

December	.17½	@	.17¾
Jan./March	.18¼	@	.18½
Jan./June	.19	@	.19⅛
April/June	.19½	@	.19¾
July/Dec.	.21	@	.21½
Smoked sheets plain, spot	.15⅛	@	.16
First Latex Pale Crepe, spot	.17	@	.17¼
November	.17	@	.17¼
December	.17¼	@	.17½
Jan./March	.18	@	.18¼
Jan./June	.18¾	@	.19
April/June	.19½	@	.19¾
Amber Crepe No. 1	.16¼	@	.16½
" " " 2	.15½	@	.15¾
" " " 3	.14⅜	@	.15
Grand Central Crepe	.14	@	.14½
Clean Thin Brown Crepe	.14¾	@	.15
Light Clean Thin Brown	.15	@	.15½
Rolled Brown Crepe	.13½	@	.13¾
Paras			
Maderia Fine	.23	@	.23½
Acre Fine	.22½	@	.23
Up-river Fine	.22	@	.22½
Up-river Medium	.19	@	.19¼
Up-river Caucho ball	.11¾	@	.12
Up-river Coarse	.11¾	@	.12
Islands Fine	.19½	@	.19¾
Islands Coarse	.10	@	.10½
Cameta	.09	@	.09½
Xingu Ball	.10	@	.10½
Tapajos fine, spot	.17½	@	.18
Pontianac			
Prime Pressed	.11½	@	—
Plantation	.06¼	@	—
Bangermassin	.07⅝	@	—
Palembang	.09¾	@	—
Siak Gutta Percha	.16⅛	@	—
Prime Macassar	2.60	@	—
Balata			
Panama Block	.35	@	—
Surinam Sheets	.69	@	—
Columbia Block	.45	@	—
Venezuelan Block	.57	@	—

Crude Rubber

NEW YORK, NOVEMBER 9, 1921

Since our report of October 20 the crude rubber market has suffered a slight weakening of prices followed by a strong recovery which is maintained at the present writing. The undertone of the market appears stronger than at any time during the past summer and fall and conservative interests in the market express the opinion that 20 cent rubber is in sight for New Year's Day.

Spot ribs are now selling for 17¼ @ 17½ cents and up-river Fine has moved up to 22½ cents. These prices are fully one cent higher than those which obtained during the slight reaction the latter part of October.

The Latex grades remain about ¼ cent per pound under ribs, and a reviving interest in futures is noticed.

Demand on the part of the manufacturing interests is steady, but not yet in any greatly increasing volume. The trading in the market is mostly interdealer.

The statistics published by the Rubber Association of America the latter part of October had a stimulating effect on the market, indicating as they did that the consumption of crude rubber by manufacturers, even during the first six months of the present year, had held up better than had been expected.

Everyone knows the greatly depressed condition of the manufacturing trade during this period, which in general had been less active than during the last six months of 1920, yet the figures show that 58,919 tons of crude rubber was consumed during the first half of 1921 by the 239 manufacturers reporting, as compared with 52,830 tons consumed during the last half of 1920. As these figures are ten to fifteen per cent short of actual consumption on account of reports not being received from all manufacturers it will be seen that consumption is being well maintained. The figures for the last half of 1921 it is expected, will show a decided increase over the first half.

Stocks in the hands of New York dealers and importers were shown to be less than was generally supposed—only 15,000 tons, which is to be compared with the approximately 70,000 tons in stock in London. Manufacturers reported about 58,000 tons on hand.

It is gratifying that a great many more manufacturers are answering the Rubber Association questionnaire. As the number grows the statistics will become progressively more valuable. The number who replied this time 239 is to be compared with 169 who replied to the last questionnaire. Naturally the important factors in the trade have replied at all times.

Crude rubber prices have been considerably influenced by the advance in sterling exchange which is quoted at 3.94½ for cables on this date.

Current quotations on standard grades are as follows:

Plantations			
Ribbed Smoked Sheets spot	.17⅛	@	17½
November	.17¼	@	.17½
December	.17½	@	.17¾
Jan./March	.18¼	@	.18½
Jan./June	.19	@	.19⅛
April/June	.19½	@	.19¾
July/Dec.	.21	@	.21½
Smoked sheets plain, spot	.15⅛	@	.16
First Latex Pale Crepe, spot	.17	@	.17¼
November	.17	@	.17¼
December	.17¼	@	.17½
Jan./March	.18	@	.18¼
Jan./June	.18¾	@	.19
April/June	.19½	@	.19¾
Amber Crepe No. 1	.16¼	@	.16½
" " " 2	.15½	@	.15¾
" " " 3	.14⅜	@	.15
Grand Central Crepe	.14	@	.14½
Clean Thin Brown Crepe	.14¾	@	.15
Light Clean Thin Brown	.15	@	.15½
Rolled Brown Crepe	.13½	@	.13¾
Paras			
Maderia Fine	.23	@	.23½
Acre Fine	.22½	@	.23
Up-river Fine	.22	@	.22½
Up-river Medium	.19	@	.19¼
Up-river Caucho ball	.11¾	@	.12
Up-river Coarse	.11¾	@	.12
Islands Fine	.19½	@	.19¾
Islands Coarse	.10	@	.10½
Cameta	.09	@	.09½
Xingu Ball	.10	@	.10½
Tapajos fine, spot	.17½	@	.18
Pontianac			
Prime Pressed	.11½	@	—
Plantation	.06¼	@	—
Bangermassin	.07⅝	@	—
Palembang	.09¾	@	—
Siak Gutta Percha	.16⅛	@	—
Prime Macassar	2.60	@	—
Balata			
Panama Block	.35	@	—
Surinam Sheets	.69	@	—
Columbia Block	.45	@	—
Venezuelan Block	.57	@	—

Reclaimed Rubber

NEW YORK, NOVEMBER 9, 1921

The strengthening of crude rubber prices has not yet been appreciably reflected in the reclaiming business, but the outlook is more encouraging as the prices for the crude increase.

Quotations are nominally as follows:

Standard Reclaims			
Floating	$.12	@	$.13
Friction	.12	@	.13
Boots and Shoes	.10	@	.10½
Boots and Shoes (washed	.13	@	.14
Mechanical	.08	@	.10
Hose	.10½	@	.11½
Tires, truck	.08	@	.09
Tires, auto	.09	@	.10
White	.13	@	.14

Scrap Rubber

NEW YORK, NOVEMBER 9, 1921

No change has been noted in the scrap rubber market during the past fortnight, and prices remain unchanged.

Quotations are nominally as follows:

Auto tire peelings	.01⅛	@	.01⅜
Standard White auto	.01	@	.01⅛
Mixed auto	.00⅝	@	.00¾
Bicycle tires	.00½	@	.00¾
Solid truck tires	.00¾	@	.01
Boots and Shoes	.03¼	@	.03⅜
Arctics, trimmed	.01⅝	@	.01¾
Arctics, untrimmed	.01¼	@	.01¼
Inner tubes, No. 1	.03¾	@	.04
Inner tubes, compounded	.02	@	.02¼
Battery jars, black compounded	Nominal		
Batteryjars, No. 1 bright fracture	"		
Inner tubes, red	.02	@	.02⅜
Heels and pads	Nominal		
Black mixed	.00¼	@	—
Garden hose	.00½	@	—
Air brake hose	.00½	@	—
Red packing	.01⅛	@	.01¾
Red mixed rubber	.02	@	—
White mixed rubber	.01¾	@	—

Akron Stock Prices

Akron rubber stock prices were strong and active during the past two weeks. It is generally conceded that liquidation is about over in the rubber industry and for that reason a steady improvement is looked for in the securities of all good companies.

Following are the quotations as of November 5:

	Bid	Asked
Amer. R & T. com.	30	35
do pfd.	..	85
Amazon Rubber	10	20
Fireston T. & R. com.	55	59
do 6 pct. pfd.	83	..
do 7 pct. pfd.	70	75¼
General T. & R. com.	195	225
do 7 pct. pfd.	83	90
B. F. Goodrich com.	31	32
do 7 pct. pfd.	76	77
do 5 yr. 7 pct. notes	94½	95½
Goodyear T. & R. com.	9½	10
do 7 pct. pfd.	27	27½
Goodyear 8's	106	107
India Rubber com.	65	70
do 8 pct. pfd.	65	70
Mason T. & R. com.	6¾	8
do 7 pct. pfd.	45	48
Marathon T. & R. com	2¾	3
Miller Rubber com.	51	60
do 8 pct. pfd.	72	75
Mohawk Rubber	75	80
Portage Rubber com.	¼	1
do 7 pct. pfd.	2	3
Rubber Products	35	50
do 8 pct. pfd.	..	100
Star Rubber com	..	75
Swinehardt T. & R. com	..	40
do 7 pct. pfd.	..	70
Phoenix Rub. com	..	15
do pfd.	..	90
Standard Tire com	..	75
do pfd.	..	90

American Rubber Patents

ISSUED SEPTEMBER 27, 1921

1,391,857—To Aloys P. Schmitt, Buffalo, N. Y. Support for tire casings.

1,391,861—To Lewis Marion Smith, Pocatello, Idaho. Device for attaching signs to glass.

1,391,885—To Henry Fraternali, Dobbs Ferry, N. Y. Cushion-heel for shoes.

1,391,985—To Gaetano E. Siino, Pittsburgh, Cal. Spring tire.

1,392,201—To Arle D. Nearon, Munice, Ind. Composite boot and shoe sole.

1,390,043—To Emanuel W. Knapp, Nevada, Ohio. Tire-retaining rim for automobile wheels.

1,390,057—To George W. Okey, Des Moines, Iowa. Pneumatic and cushion tire.

1,390,058—To Victor A. Parker, Akron, Ohio, assignor to B. F. Goodrich Co., Akron, Ohio. Tire-mold.

1,390,249—To Henry C. Privett, Long Beach, Cal. Puncture-closing tread strip.

1,393,560—To Anton Maurer & James J. Brossoit, Salt Lake City, Utah. Spare-tire holder.

1,392,951—To Edward W. Lee, Los Angeles, Calif. Pneumatic Tire.

1,393,196—To Bert E. Brightweiser, Wichita, Kansas. Detachable Tire-Protector.

1,393,644—To Floyd W. Russell, Akron, Ohio. Method of making pneumatic-tire shoes.

1,393,575—To John M. Roll. Correctionville, Iowa. Tire, tread removing device.

1,392,923—To George E. Draper, Pittsburg, Kansas. Tire valve.

1,392,953—To William D. McNall. Vehicle tire.

1,393,185—To Samuel J. Todd, Detroit, Mich. Puncture proof shoe for pneumatic tires.

1,393,377—Martin Jelalian, Cranston, R. I. Spring cushion device for vehicle tires.

1,393,495—To George H. Bunnell and Bliss E. Titus, Midway, Utah. Vulcanizer.

1,393,091—To Powell Crosley, Jr., Cincinnati, Ohio. Vulcanizer.

ISSUED OCTOBER 18, 1921

1,394,300—To John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N. Y. Reinforced-rubber article.

1,393,773—To Enoch Grill, Grand Rapids, Mich. Tire.

1,393,849—To Herbert H. Swan, Grand Rapids, Mich. Tire.

1,393,952—To Charles E. Miller, Anderson, Ind. Tire-casing.

New Incorporations

NEW YORK

Tire Machinery & Equipment Co., to manufacture tire machinery etc. $25,000. Incorporators: M. L. Cohn, A. C. Grover, F. J. Leyton, all of 20 Broad Street, New York.

Republic Raincoat & Clothing Co., to manufacture rubberized clothing. $50,000. Incorporators: I. Schwartz, 42 E. Broadway; B. Leavitt, 311 E. 9th Street; D. Kugel, 27 Lenox Avenue, New York.

DELAWARE

Bear Rubber Mills, to deal in tires, tubes, etc. $1,000,000. Incorporators: D. E. Cameron, C. Massey, C. J. Kelly, all of San Antonio, Texas. Delaware Agent, United States Corporation Co., 311 South State Street, Dover.

Di-O-La Corporation, to manufacture and deal in syringes, etc. $500,000. Incorporators: W. Fairchild, New York; I. Ellis, D. C. Beatty, both of San Francisco, Calif. Delaware agent, American Guaranty & Trust Co., 206 West 9th Street, Wilmington.

Englert & Englert, Inc., to manufacture and deal in rubber tires, inner tubes and automobile accessories. $100,000. Incorporators: T. L. Croteau, M. A. Bruce, C. H. Maxwell, all of Wilmington. Delaware agent, Corporation Trust Co. of America, Du Pont Building Wilmington.

Fibre Tire & Rubber Co. Inc., to manufacture tires and tubes, etc. $3,000,000. E. F. Stoeckle, president; C. Dunster, vice-president; L. E. La Bar, treasurer; M. N. Salamon, assistant treasurer; W. B. Holton, secretary. Principal office, 1819 Broadway, New York. Delaware agent, United States Corporation Co., 311 South State Street, Dover.

Giant Tires Co., to manufacture and deal in tires. $3,000,000. Incorporators: L. B. Phillips, M. F. Vance, all of Dover. Delaware agent, United States Corporation Co., 311 South State Street, Dover.

Hayward Rubber Co., to manufacture tires, etc. $200,000. Incorporators: W. G. and L. T. Zimmerman, both of Philadelphia, Pa.; E. C. Boyd, Wilmington. Delaware agent, H. P. Joslyn, 400 Ford Building, Wilmington.

National Auto Stores, Inc., to deal in tires and accessories. $40,000. W. H. Nichols, president; L. J. Smith, vice-president; B. A. Tuttle, secretary and treasurer. Principal office, South Bend, Ind.

Sampson-Martin Corporation, to manufacture hot and cold water bottles, ice bags, etc. $750,000. Incorporators: W. F. McDermott, New York City; P. M. Kelly, Roselle; T. L. Harrison, Ridgefield Park, both in New Jersey. Delaware agent, Corporation Service Co., Equitable Bldg., Wilmington.

Tru-Matic Tube and Tire Mfg. Co., to buy, sell and deal in rubber tires and tubes. $1,000,000. Incorporators: T. L. Croteau, M. A. Bruce, C. H. Maxwell, all of Wilmington. Delaware agent, Corporation Trust Company of America, Du Pont Building, Wilmington.

OHIO

Accurate Rubber & Insulation Co., to manufacture and deal in commercial articles composed of rubber. $15,000. Incorporators: F. A. Clark, 1854 Crawford Road; C. F. and M. A. Heinkel, both of 1181 E. 84th Street; L. Brown, 1184 East 84th Street; R. S. A. Burgeson, 1185 E. 84th Street, all of Cleveland. Principal office, 614 Park Building, Cleveland.

Garland Rubber Co., to manufacture toy balloons and rubber specialties. $10,000. Incorporators: D. McQuate, L. E. Mansfield, both of Ashland; C. H. and F. Mansfield, W. W. McQuate, all of Marion. Principal office, Marion.

Henry Cord Tire Co., to manufacture tires and tubes. 100 shares capital. Incorporators: R. and E. Burroughs, J. A. Swinehart, M. Rosenblatt, H. R. Farral, all of Akron. Principal office, Akron.

Mercury Rubber Co., to manufacture and sell tube repair kits, patches and all accessories incidental to automobile tires and tubes. $10,000. A. C. Fisher, president and general manager; C. W. McDaniel, vice-president and sales manager; P. M. Lynch, secretary and treasurer; R. S. Worthington, assistant sales manager. Principal office, 31 Oakdale Avenue, Akron.

Talbott Rubber Co., to manufacture and deal in rubber articles. $50,000. Incorporators: F. R. Talbott, J. W. Cully, R. S. Lucas, C. A. Crummel, C. C. Craig, all of Cleveland. Principal office, Cleveland.

ALABAMA

Crawford Quick Tire Service, to deal in tires, etc. $3,000. Incorporators: S. J. Bowie, F. A. Neckel, F. Stevens. Principal office, Birmingham.

IDAHO

Consumer's Automotive Co., to sell tires, tubes and automobile accessories. $10,000. Incorporators: H. T. and S. D. Bundy, L. Arras, W. P. O'Connor, H. Burkdoll, all of Nampa, Idaho.

ILLINOIS

City Tire Co., to manufacture, buy and deal in tires and automobile accessories. $15,000. Incorporators: H. T. McHale, 1116 Columbia Avenue; J. K. Franey, 65 East Harrison Street; C. Krutchoff, County Building, all of Chicago. Principal office, 65 East Harrison Street, Chicago.

Fogel Tire Co., Inc., to manufacture, buy and sell tires, tubes and automobile accessories. $20,000. Incorporators: R. Fogelson, 1500 West Roosevelt Road; I. Raisman, 1218 North Kedzie Avenue; F. Wolfberg, 4919 Glenwood Avenue, all of Chicago. Principal office, 1500 West Roosevelt Road, Chicago.

MASSACHUSETTS

Hodges Co., The William L., to manufacture and deal in tires, etc. $25,000. W. L. Hodges, president; H. B. Josselyn, treasurer and clerk, both of 783 Beaver Street, Waltham; L. H. Josselyn, 2 Waterson Road, Newton, Mass. Principal office, Boston, Mass.

McClaren Tire Co. The, to deal in belting, tubing, tires, etc. $25,000. R. W. Johnston, president; P. L. Johnston, treasurer, both of 33 Farquhar Street, Roslindale; F. W. Thayer, clerk, 122 Talbot Avenue, Dorchester, Mass. Principal office, Boston, Mass.

Worthy Manufacturing Co., Inc., to print, dye and waterproof textiles. $10,000. A. C. Rowe, president, 42 Liberty Avenue, Somerville; F. C. and B. L. Heyl, both of 243 Chestnut Avenue, Jamaica Plain, Mass. Principal office, Boston, Mass.

MINNESOTA

H. V. Eva Tire Co., to deal in tires. $50,000. H. V. Eva, president and treasurer; V. E. Eva, vice president; A. N. Amundsen, secretary. Principal office in Duluth.

Martin County Tire & Repair Co., to deal in tires and automobile accessories. $25,000. W. J. Knight, president; L. A. Knight, secretary; E. E. Knight, vice-president. Principal office, Fairmont.

NEW JERSEY

Bus Tire Service, Inc., to deal in automobile tires, etc. $100,000. Incorporators: James, Joseph F. and W. Lynch, all of 552-4 Ferry Street, Newark. Principal office, 381 Broad Street, Newark. Agent in charge, J. Lynch.

Snyder Auto Service, to deal in tires, tubes, etc. $100,000. Incorporators: G. A. and L. Snyder, both of 22 Liberty Street; C. R. Pancoast, 247 Bloomfield Avenue, both of Passaic; A. MacCulloch, 81 Cambridge Ave., Garfield. Principal office, 183 Jefferson Street, Passaic. Agent in charge, C. R. Pancoast.

NORTH CAROLINA

Trail Blazers' Association, Inc., to manufacture tires and casings $100,000. Incorporators: J. G. Isenhour, L. L. Rose, M. K. Thomas, all of Nashville. Principal office, Asheville.

SOUTH CAROLINA

Sullivan Sales Corporation, M. S., to buy, sell and manufacture tires etc. $20,000. M. S. Sullivan, president and treasurer; H. Svendsen, secretary. Principal office, Charleston.

OKLAHOMA

Hood Tire Co., to manufacture, repair, buy and sell tires. $10,000. Incorporators: R. F. Cope, H. P. Cooper, L. S. Jackson, all of Oklahoma City.

Progressive Auto Service Co., to deal in tires, etc. $1,000. Incorporators: L. H. and P. Prescott, R. I. and G. Lynch.

Service Tire & Supply Co., to sell tires, tubes and automobile accessories. $35,000. Incorporators: J. T. Richards, M. D. Tipton, H. G. Weaver. Principal office, 429 West Broadway, Muskogee.

WASHINGTON

Jack Tire & Rubber Co., to manufacture and deal in rubber materials. $1,000,000. Incorporators: C. D. Randall, F. B. Donskin, J. B. White. Principal office, Spokane.

THE RUBBER AGE BUYERS GUIDE

ACCUMULATORS
Adamson Machine Co., Akron, O.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Wellman-Seaver-Morgan Co., Cleveland, Ohio.

ACIDS
Harshaw, Fuller & Goodwin Co., Cleveland, O.
National Aniline & Chemical Co., Inc. New York.

ACID TANKS
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.

AIR & STEAM METAL BAGS
Allsteel Ridewell Tire and Rubber Co., Dayton, Ohio.

AIR BRAKE HOSE
United States Rubber Co., New York.

AIR GOODS
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., Tuckahoe, N. Y.
United States Rubber Co., New York.

AIR MATTRESSES
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., Tuckahoe, N. Y.
United States Rubber Co., New York.

AIRPLANE AND BALLOON CLOTHS
United States Rubber Co., New York.
Hodgman Rubber Co., Tuckahoe, N. Y.

ALBA WHITING
Daigger, A., & Co., Chicago, Ill.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Industrial Chemical Co., New York.

ALCOHOL
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Tyler Patterson Co., Clev'd, O.

ALUMINUM FLAKE
Aluminum Flake Co., Akron, Ohio.
Butcher, L. H., Co., New York, San Francisco.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.

AMMONIA AQUA
Laidlaw, Kelly & Co., New York.
Tyler Patterson Co., Clev'd, O.

ANGLE THERMOMETERS
Taylor Instrument Companies, Rochester, N. Y.

ANILINE OIL
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Klipstein, A., & Co., New York
National Aniline & Chemical Co., Inc. New York.
Tyler Patterson Co., Clev'd, O.

ANILINE OIL PLANTS
Devine, J. P., Co., Buffalo, N. Y.

ANTIMONY, SULPHURETS
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Klipstein, A., & Co., New York.
Rare Metal Products Co., Belleville, N. J.
Tyler Patterson Co., Clev'd, O.
Typke & King, Ltd., Mitcham, England.

APRONS—RUBBER
Hodgman Rubber Co., Tuckahoe, N. Y.
Miller Rubber Co., Akron, Ohio.

ARTIFICIAL RUBBER
Carter Bell Mfg. Co., New York.
Stamford Rubber Supply Co., Stamford, Conn.

ASBESTINE
Butcher, L. H., Co., New York.
Daigger, A., & Co., Chicago, Ill.
Fulper, Edward B., Trenton, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Tyler Patterson Co., Clev'd, O.

ATOMIZERS
The Rubber Products Co., Barberton, Ohio.

AUTOCLAVES
Devine, J. P., Co., Buffalo, N. Y.

AUTOMOBILE COATS
Hodgman Rubber Co., Tuckahoe, N. Y.
United States Rubber Co., New York.

AUTO TOP FABRICS
Hodgman Rubber Co., Tuckahoe, N. Y.
Taylor, Armitage & Eagles, Inc.,
Turner Co., J. Spencer, New York.
United States Rubber Co., New York.

BALATA
Wood, Charles E., New York.

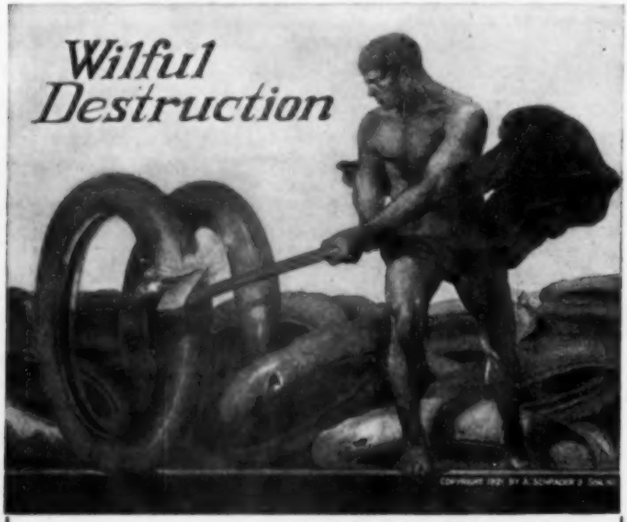
BALATA FILM (Colorless)
Peters Bros. Rubber Co., N. Y.

BALLOON FABRICS
United States Rubber Co., New York.

BALLOONS. TOY
Miller Rubber Co., Akron, Ohio.

BALLOONS, TOY, DYES FOR
National Aniline & Chemical Co., Inc. New York.

BALLS, DOLLS AND TOYS
Davol Rubber Co., Providence, R. I.
Essex Rubber Co., Trenton, N. J.
Miller Rubber Co., Akron, Ohio.
New York Rubber Co., New York.
United States Rubber Co., New York.



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